620

Contractors and Engineers

magazine of modern construction

AUGUST 1955

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Working in rugged terrain, a Lima 1201 dragline with an Esco 4-yard bucket dumps excavated material along a 12-foot-wide and 15 to 25-foot-deep trench being prepared for a new concrete aqueduct. The 9-foot-diameter line is part of the metropolitan water system in southern California.

Page 6.

How To Obtain Concrete Which Will Have Minimum Shrinkage

Drying shrinkage, as every concrete man knows, is a serious enemy of good concrete since it causes cracks.

Whatever the cement content of a mix or the water-cement ratio, drying shrinkage is governed mainly by unit water content. (U.S. Bureau of Reclamation Concrete Manual, page 40, 5th edition.)

With Pozzolith, lowest possible unit water content can be obtained, whatever the workability requirements, resulting in a substantial reduction in drying shrinkage.

By greatly reducing drying shrinkage, Pozzolith helps overcome cracking—important to do in tunnels like the one shown below to avoid seepage, and formation of ice where temperatures go down to freezing.

Other advantages resulting from lowest possible unit water content with Pozzolith are reduced permeability, increased bond of concrete to steel and improved resistance to freezing and thawing.

In Venezuela's Mile-Long Boqueron Tunnel...

Boqueron Tunnel, Caracas, Venezuela.
Design and supervision by the Ministerio de Obras Publicas.
Gen. Contr.—Cia. Anonima Morrison-Knudsen de Venezuela.

Engineers Employ POZZOLITH... To Improve Control of Concrete Quality...

POZZOLITH... *the key to-*

- lowest possible unit water content*
- close control of entrained air... placing consistency... rate of hardening
- reduced costs

* For a given set of materials and water-cement ratio, unit water content (water required per cubic yard of concrete) is the most important basic factor affecting the quality of concrete. A.C.I., Committee 613, 1944 Report, Page 655. Bureau of Reclamation's current Concrete Manual, Page 130.

Tunnels of all types—highway, railroad and water—are among the outstanding structures built since 1932 in which Pozzolith has enabled engineering to better control concrete quality.

Engineers employ Pozzolith with confidence because:

1. ***proved performance***...60 million cubic yards of concrete produced with Pozzolith in past five years alone for all types of jobs.

2. ***applied know-how***...over 70 skilled Master Builders' field technical men for product-use consultation.

3. ***available everywhere***...1000 ready-mix and job-site plants now producing concrete with Pozzolith.

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Section of Masterplate Floor
Note Thickness of Armored Surface

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Only with Masterplate can an "... Masterplate floor with all of its service ... tages be obtained. This is because only ... plate contains Master Builders exclusive ... ment-dispersing agent which makes it ... to float easily a pound or more of the ... ductile metal on fresh concrete and keep ... the surface. (Available as Standard Mast... and Ready-4-Use Masterplate — a ... product, ready to use as it comes from ... package.)

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All plain cement-sand mortars shrink, ... voids and capillaries as convenient paths ... water penetration. Shrinkage may cause ... to crack and lose bond.

Embeco Pre-Mixed Mortar provides a ... of easy placeability that is non-shrink, ... a strong bond between old mortar or ... and new mortar. Repairs made with ... Pre-Mixed Mortar are dense and tough ... sist water penetration.

Embeco Pre-Mixed Mortar is ready ... —add only water and mix.

Typical uses of Embeco Pre-Mixed ... patching concrete floors, steps, walks ... ing wall and floor cracks; grouting ... through walls; tuck pointing; caulking ... between floor slabs and basement walls ... of concrete pipe; repair of brick and ... joints; etc.

A 4-page folder on Embeco Pre-Mixed ... covering applications, advantages, ... rections and estimating data may be ... from the manufacturer, The Master ... Co., Cleveland 3, Ohio.

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To avoid shrinkage—principal cause ... in equipment grouts—plant engineers ... beco Pre-Mixed Grout, the product ... easier to use and provides a non-shrink ... life grout.

Cross-section shows how an easily ... flowable Embeco Pre-Mixed Grout ... acts shrinkage to produce full ca... bedplate.

Embeco Pre-Mixed Grout is ready-... add only water and mix. Uniformly ... sults are assured because: (a) all ... are accurately proportioned and ... blended (b) cement is quality-tested ... clean, sharp, scientifically graded ... cially formulated in Master Builders ... for the recommended applications. ... Embeco Pre-Mixed Grout is recom... grouting heavy equipment, machine ... bolts, building columns, bridge seat... lar applications.

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Contractors and Engineers
magazine of modern construction

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EDITORIAL

Profit-making and the superintendent

In recent years, the source of supply for supervisory personnel in the construction industry has changed significantly. Formerly, superintendents and project managers were recruited for the most part from the ranks of key foremen in the field. Today, more and more, superintendents are picked from the top level of classes in engineering colleges, given a short period of training, and put to work in the field to gain the experience a good superintendent needs.

This gradual change in the source of supply has come about partly because strong labor unions have encouraged specialization in a single craft rather than general training in over-all operations.

As a result of the change, contractors have gained some excellent supervisory personnel. At the same time, they have opened the door to some possible hazards to their business and the industry as a whole. This danger, we believe, lies in the fact that these engineer-superintendents have little or no awareness of the complexities of profit-making in the contracting business.

The fact which threatens to nullify the gains made in the caliber of general superintendents is that many of these young engineers have too little appreciation of the laws of practical economics. Too little emphasis is being placed on the working principles of our economic system in their curricula. And it is under the laws of this system that a superintendent must operate if he is to earn profits.

It will not be easy to rectify this condition. The young inexperienced engineering student or graduate cannot be expected to handle both the practical and theoretical factors of a job as would an older more experienced man. Preoccupied with the academic or technical aspects of an engineering course, both the students and their teachers are frequently prone to overlook the very important financial factors involved in the application of that training in the field.

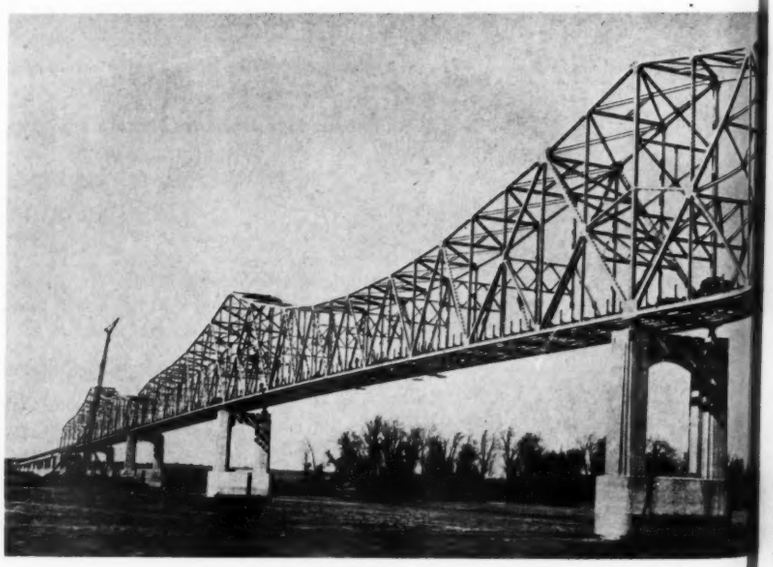
One course of action is clear. The young engineer-superintendent's first interview, his indoctrination, and his later practical training should be designed to retain what is practical in his education and to eliminate what is only theoretical. In particular, this postgraduate training period should emphasize the factors of economy and efficiency (which is the practice of economy) in construction management and supervision.

The ultimate goal is, of course, for the contractor, the engineering graduate, and the professor to talk the same language. Not until that goal is realized will the engineering school satisfactorily produce the kind of superintendent or project manager the construction business really needs.

NEWS AND VIEWS

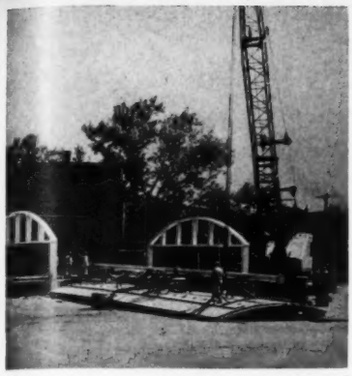
Eyebrows probably shot up when two deep sea divers were flown into Yankton, S. Dak. for work at Gavins Point Dam recently. But this project, on which CONTRACTORS & ENGINEERS reports on pages 22, 23, and 44 of this issue, required their services for righting a 20-inch dredge found listing at a 90-degree angle about a mile east of the dam several weeks ago. The machine was scheduled to be used in closure operations, and the divers had the job of passing cables under its hull so that a crawler tractor operating from a nearby sandbar could pull the dredge upright. Repairs to the dredge are expected to be done in time to permit closure operations to be finished on schedule.

A humorous novel about occupied Japan by Elliott Chaze has nothing at all to do with the new Socony-Mobil building being constructed in New York. But tongue-in-cheek, G. M. Basford Co., New York, N. Y., is using the novel to do an effective—and amusing public relations job on the structure for the Committee of Stainless Steel Producers, American Iron & Steel Institute. The building is sheathed, as the book's title suggests, in a "Stainless Steel Kimono".

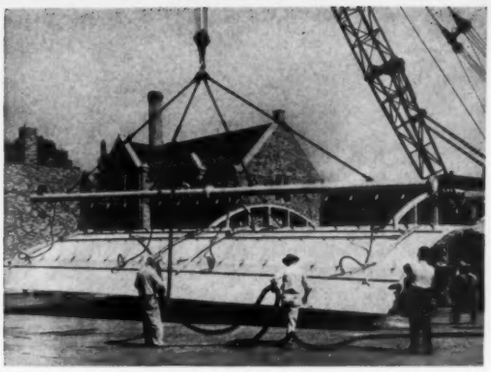


Over 4,700 tons of structural steel and steel-grid floor are going into this new highway bridge across the Illinois River. Allied Structural Steel Cos., Chicago, are fabricating and erecting the 3,624-foot-long structure.

Minnie Griffiths probably attracted a lot of attention as the only coed at the University of Akron's College of Engineering for several years. She's attracting quite a bit more now, for in addition to romping away with the highest academic averages in the history of the college, she has been given the Robinson engineering award, an honor conferred annually by the Robinson Clay Product Co., Akron, in recognition of accomplishment in the undergraduate field.



The precast concrete trusses are positioned on the columns, as a P&H crane prepares to erect the stacked thin-shell half-sections.



A Vacuum Concrete lifting device, with a pipe connected to a vacuum pump and two lifting pads, raises the shell as force is applied through a system of pulleys.

The crane has set the half-shell in position on the truss. When all the half-shells are set, 8-inch longitudinal and transverse joints will be poured in place.

New type of precast roof is set with vacuum method

Thin shell curved units save on formwork costs; sections can be adapted to various spans and widths

The Ortega-Billner precast roof—a new type of curved thin-shell concrete construction—was used for the first time in this country to enclose a 100×38-foot swimming pool at St. Joseph's House for Boys in Philadelphia, Pa. The roof is made up of shells precast in stacks on the ground, lifted into position by crane, and connected by poured-in-place joints. Formwork was required for only the first curved unit cast.

The barrel-roof shells measure about 50 feet long, 38 feet wide, and 2½ inches in average thickness, and have a rise of 6 feet and a radius of 30 feet. Their ends are supported by trusses, so that they form a roof over the structure with column spacing 50×38 feet.

Since shells were precast in halves, each individual unit measured about 50×20 feet and weighed almost 15 tons. Reinforcing was provided by a double layer of 3×6-inch wire mesh, and 18 rods, ¾ to ½-inch in diameter, which followed the lines of principal stress. During concrete pouring, the radius of curvature of the shells was kept constant. The thickness of the shells varied from 2¼ inches at the crown to 2¾ inches at the edge.

Shells taken from the stack were raised onto the trusses by a special lifting device manufactured by Vacuum Concrete, Inc., Philadelphia.

This device has a 10-inch-diameter pipe, 50 feet long, which serves as both a vacuum chamber and a structural member. A hose connects it to a vacuum pump and to two lifting pads. The pads, 50 feet long and 1 foot 6 inches wide, are plywood mats with sponge rubber around the perimeter to insure a vacuum being created and held. Force is applied through a system of pulleys and ¼-inch-diameter wire rope connected to the pads.

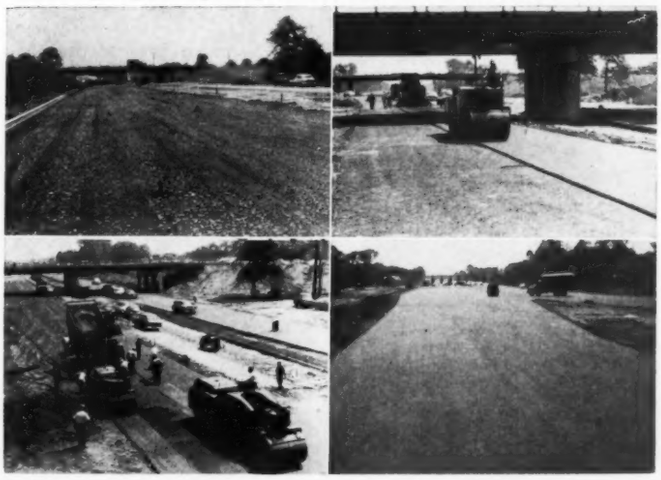
After the sections were in place, reinforcing extending from each half-shell overlapped 6 inches so that 8-inch longitudinal and transverse joints could be poured. Transverse ties were made with the dowel bars protruding from the truss. THE END

Varying the Asphalt pavement design cuts cost of New Jersey's Garden State Parkway

Like the New Jersey Turnpike, America's most heavily traveled toll road, all but 20 miles of this State's 165-mile Garden State Parkway is paved with resilient, durable, economical Asphalt. The Parkway connects northern New Jersey with the chain of popular resorts along the Jersey shore, notably Atlantic City and Asbury Park. An estimated 53,000,000 vehicles will use the expressway this year.

In designing the asphalt pavement for the Garden State Parkway, full advantage was taken, in the interest of economy, of the ample supply of sand and gravel in southern New Jersey and of trap rock in the north. A hot-mix sand-asphalt foundation was specified in the south and either an asphalt (penetration) macadam or dry-bound macadam foundation in the north.

While the foundation varied to take advantage of local aggregate, the same dense-graded asphaltic concrete wearing surface was laid north and south.



(top) Completed dry-bound macadam foundation.
(bottom) General view of asphalt paving operations.

(top) Laying second course of hot-mix Texaco Asphaltic Concrete.
(bottom) Finished Texaco Asphaltic Concrete pavement on Garden State Parkway.

THE PHOTOGRAPHS show a heavy-duty 2½-inch Texaco Asphaltic Concrete wearing surface being laid on a northern section of Garden State Parkway. On this section, the asphalt surface was constructed over a 7½-inch dry-bound macadam foundation, which received a tack coat of cutback asphalt. The Texaco Asphaltic Concrete pavement on each half of the divided expressway is 24-feet wide, flanked on both sides by asphalt (penetration) macadam shoulders.

Your own highway, street, airport or parking area project may call for heavy-duty paving, a low-cost surface for light traffic or an inexpensive surface-treatment. Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils offer a wide choice of improvements, which include one exactly suited to your requirements. Helpful information on all of these types is furnished in two free booklets you can obtain by writing our nearest office.

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TEXACO ASPHALT

Heavy equipment sets pipe for concrete aqueduct

The 12-foot-wide trench for the line is brought almost to grade by a Lima 1201 dragline with Esco 4-yard bucket. Only a fine-grading laborer assists the crane operator to complete the 15 to 25-foot-deep cut with 1 to 1 side slopes.

A section of 27-ton concrete pipe is lowered into the trench by a Manitowoc crane with 50-foot boom. This rig has 5 extra tons of counterweight at the rear for more stability and lifting power.

Crews run 9-foot-diameter pipe, both steel and concrete, over mountains, under riverbed, and beneath road and railway

(Additional photo on front cover)

Construction of a heavy concrete aqueduct running through rugged mountains, under a highway and railroad for 225 feet, and 50 feet under the bed of a river is one of the toughest parts of current work on the new metropolitan water system in southern California.

Since the system was started in the 1930's, work has been rapid on the main aqueduct, canals, and pump lifts. The main line delivers Colorado River water to Lake Matthews, a storage area about 58 miles east of Los Angeles. A considerable number of feeder lines have already been built to cities in southern California, and the 6-mile project now under way will tap Lake Matthews, creating a feeder system between the lake and a storage reservoir at Irvine, and bringing much-needed water to fast-growing cities in Orange County.

Terrain alone is making this newest pipeline project a difficult job for Freeway Constructors, San Gabriel,

As a section is set, a pull is rigged to make the joint watertight against the gasket. Wherever possible, sections are being lifted off delivery trucks and swung directly into place in the trench.

A 2:1 mix of cement and sand is chuted from the Kwik-Mix 2-sack concrete mixer on the berm to workmen filling joints. Joints are being filled flush with inside and outside pipe walls. In the background, a Cat D8 backfills the trench.

Wire mesh around the pipe reinforces concrete being placed at the joints. The 1½-inch-diameter manila ropes on each side of the joint and the sheet metal covering make the joint watertight.

Calif. The line drops from the top of mountain country—in one place the drop is 175 feet in elevation on a 60 per cent slope—to a low point at the Santa Ana River, then rises again through another mountain gap to the north. This, creating a 2-mile-long inverted siphon which will have high working pressures, caused designers to use 109-inch-ID steel pipe with wall thickness ranging from 31/32 to 1 3/16 inches. The pipe consists of male and female slip joints, welded to make the line continuous.

The remaining portion of the aqueduct consists of twelve joints of 9-foot-ID concrete pipe, weighing about 27 tons per section. Each section has regular Lock Joint watertight features with a rubber gasket.

Dual trenching crew

Three Caterpillar D8 tractors and dozers started the work in February 1955, clearing trees away from some of the canyons and brush from places in the path of the line. High knobs are flattened off so that trench excavation can be held to a maximum depth of 25 feet. Even at this depth, it is necessary to cut the ditch on a 1 to 1 ratio to eliminate caving danger. The dozers, working at least a mile ahead of the main equipment string, clean up the ditch site, clear and pile brush for burning, and build the necessary service roads.

Two trenching crews, covering a double shift, are using a Lima 1201 dragline with an Esco bucket on a 45-foot boom to cut the trench with 1 to 1 side slopes and a bottom width of 12 feet. From 15 to 25 feet deep, the trench is being finished practically to grade by the dragline operator, with limited help from one fine-grading laborer. The Lima has proved effective in dirt conglomerate, and even soft sandstone, but if harder formations make drilling and shooting necessary, Freeway Constructors plans to use several Gardner-Denver portable air compressors. At present, job officials hope to finish the work with limited drilling and blasting.

Practically all the excavated dirt is being wasted within the the right-of-way, but where some of the trench crosses county road right-of-ways, several trucks are being used to move the muck to waste dumps. Wherever bell holes are necessary to let men get under the pipe joints, digging is done by a Northwest 1½-yard crane, equipped with an Owen clamshell bucket. The dirt from bell holes, like dirt from the main trench, is being spoiled to one side.

Concrete and steel pipe sections are being supplied by Basalt Rock Co., Inc., Napa, Calif., a firm which has pioneered many new concrete techniques. The 12-foot concrete pipe joints are being manufactured entirely at the firm's commercial plant at Fontana. The 32-foot-long sections of steel pipe turned out at Fontana are trucked to the American Pipe & Construction Co. plant at South Gate, where they are coated with American's patented concrete-coating process. Trucks from trucking contractor Keith Williams, Riverside, deliver all the various lengths of pipe along the trench as needed.

Procedure involves big lifts

In installing the pipe, it has frequently been necessary to handle 27-ton concrete pipe sections with the boom of the Manitowoc 2900 crane at an angle up to 45 degrees. In many

(Continued on next page)

MULTIPLE DUMPING AT SPECIFIED INTERVALS WITH HOBBS *Schonrock Cable Dump* TRAILERS

To meet rigid specifications in highway construction, HOBBS Schonrock Cable Dump TRAILERS equipped with Batch Gate Attachments are designed to permit operators to dump two or more times from one trailer. Thus short-haul contractors are taking advantage of the lower cost hauling of HOBBS Schonrock Cable Dump TRAILERS. Size of dumps and dumping interval are easily controlled.

HOBBS TRAILERS

Aggregate Hauling Contractor Says:

"Batch Gates Make HOBBS Schonrock Cable Dump TRAILERS Perfect Tools for Short-Haul Contractors"

The practical application of batch gate dumping of partial loads at specified locations was conceived by A. C. McMillian, (left), Fort Worth Contractor who operates 24 HOBBS Schonrock Cable Dump TRAILERS equipped with batch gates.

These gates designed by Hobbs Manufacturing Company as an accessory allow contractors to use HOBBS Schonrock TRAILERS in conjunction with dump trucks and on projects which formerly were out of their operational scope. And according to Mr. McMillian, less manpower, less maintenance and less fuel are required in operating cable dumps.

Need for lower operating costs and necessity to meet rigid specifications have caused earth-hauling contractors to realize the importance of the increased capacity, rugged construction and operating ease of HOBBS Schonrock TRAILERS.

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(*Continued from preceding page*)

places, three or four pioneer roads with laying berms or work platforms have been necessary in a single raise.

The Manitowoc installing the pipe has a 50-foot boom and measures 16½ feet between center lines of tracks. A high-capacity rig, its normal stability and lifting power have been increased by five extra tons of counterweight at the rear. Even in the worst places, this machine is handling the 27-ton concrete sections without mishap.

The pipeline operation has been set up on a 8-joint-a-day average for single-shift work. Pipe is being laid on a fine-grade usually prepared just before sections are ready to go in. The trench, already dug to close tolerance, needs only a few finishing touches with hand shovels, since excess dirt is simply shoveled over to the side of the trench.

Whenever possible, the pipe-placing routine begins with a section being picked directly off the hauling truck and swung into the trench. If direct handling is not possible, the sections are laid temporarily on the ground.

Tunnel under railroad and highway

The pipe is still to be laid in two of the most difficult areas: at the Santa Ana River crossing, and in a tunnel under U. S. 91 and the Santa Fe railroad tracks. A unique pulling and jacking system will be used to install the pipe in the round tunnel, which is being excavated with two Le Roi air compressors and several Ingersoll-Rand and Thor clay spades. The clay spades are being used to dislodge the conglomerate material under the road and railroad, and an Allis-Chalmers HD-9 with a Tractomotive 2-yard front-end shovel are moving the loosened material from the tunnel. Armco bolted liner plate will brace the tunnel and hold the cement grout filling between the tunnel and sides of the pipe.

Just inside the tunnel portal, the steel pipe will be erected one 32-foot joint at a time. As a joint is welded, a dragline stationed on one side of the tunnel will make a direct pull on the steel pipe. When the end of the pipe is even with the tunnel portal, another joint will be welded in place and the process repeated. During the pull, the pipe will be supported on two sets of steel railroad rails, embedded in the floor of the tunnel. When the pipe has reached most of its ultimate tunnel, about 250 tons of pull will be necessary before the heavy weight will move. A jacking system will undoubtedly have to be used to help the dragline when the pipe length gets over 100 feet.

Pipe goes under river

At the Santa Ana River, the pipeline will be submerged 50 feet below the normal river bed, well into the alluvial river overburden and sandstone. Plans are to dig a minimum of 6 wells—all of them of the deep-sump type—and to unwater the area with high-capacity electric deep-well turbine pumps. Two of these wells are already complete, and one, equipped with a Pomona deep-well turbine, is helping to furnish compaction moisture. The contractor's superintendent also is considering the possibility of using Stang low-head pumps for the operation.

At present, MWD is using the river for the transportation of approximately 160 cubic feet of water per minute, but between August 1 and October 1, 1955, this flow will be reduced to 10 cfm. Officials believe the pumping scheme will unwater the area with a minimum diversion of the stream. As the unwatering job is completed, the excavating dragline will move in with a 4-yard Esco bucket. If the trench can be excavated in the dry, the pipe will also be installed under the same condition.

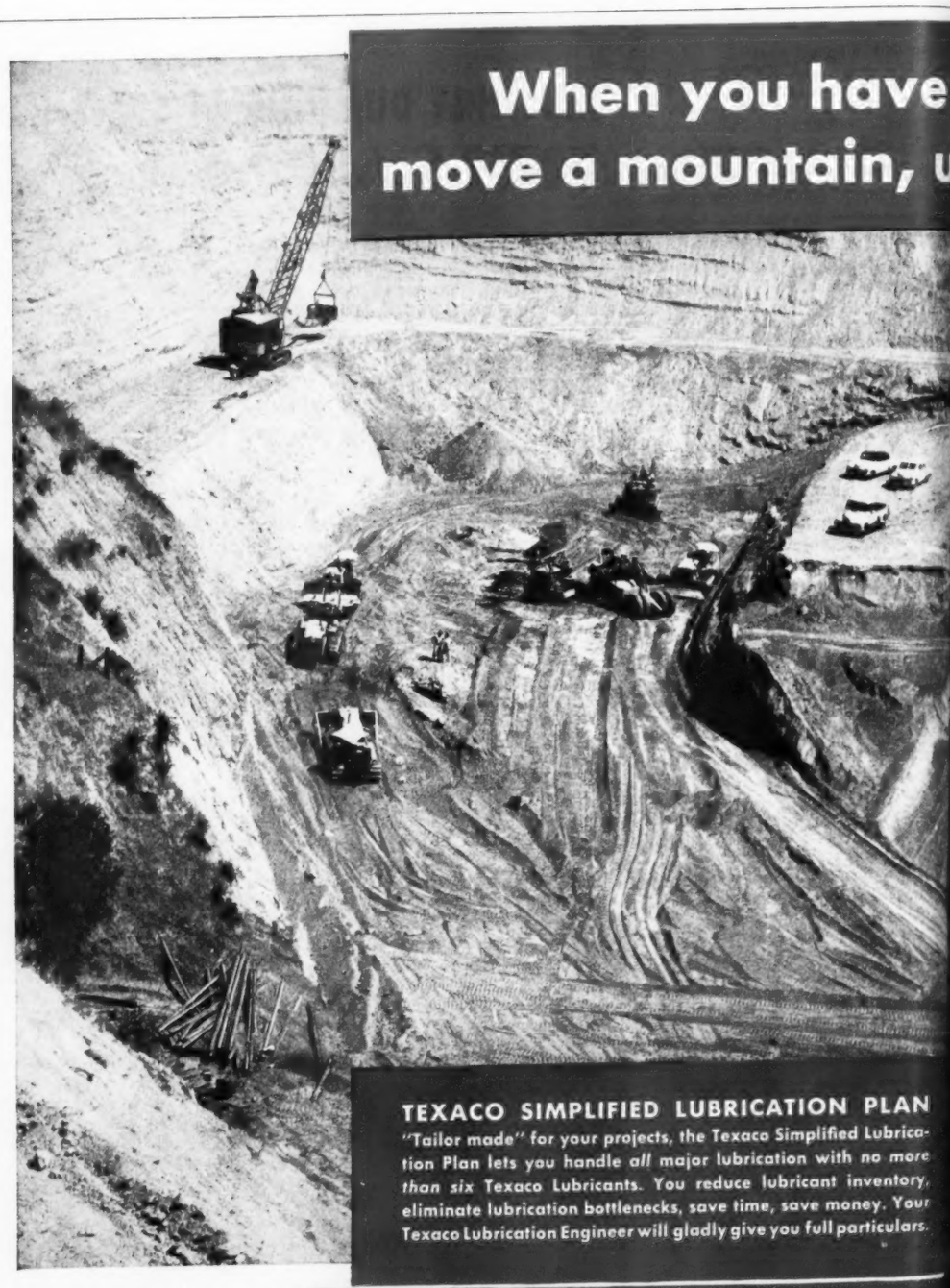
Jointing and backfilling

The final operation in the project consists of filling the joints and backfilling the pipe. Concrete pipe joints are being filled flush with the pipe walls inside and out by a 2 to 1 mix of cement and sand, applied after the pipe is laid. On steel pipe, wire-mesh reinforcing is used outside a welded connection joint to reinforce concrete which will coat the welded joint. In pouring this coating, 1½-inch diameter manila ropes are installed on each side of the joint, and a sheet metal covering is laid around the entire circumference of the pipe to contain the grout and make the joint watertight. The cement grout is mixed with water in a small Kwik-Mix 2-sack concrete mixer.

In the welding of a steel line of average thickness, eight passes of electric arc rods are made both inside and outside the pipe. A total of 19 electric welding machines—mostly 200-amp Lincolns—permit 10 welders to work inside the pipe and 9 to work outside. Welding is done in three passes down and five up with Airco 78E rods.

After each pass, the weld is peened by a Black & Decker electrically operated gun. The peening is done more to dislodge slag which might be left after a weld than to relieve stress.

The pipeline trench above the aqueduct is being backfilled in two passes by a Caterpillar D8 equipped with a conventional cable-controlled dozer. On the first pass, the pipe is loaded evenly from both sides until it is completely covered. At that point, water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TUNE IN...TEXACO STAR THEATER starring JIMMY DURANTE or DONALD O'CONNOR on television... Saturday nights, NBC.
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CONTRACTORS AND ENGINEERS

is turned on to flood the dirt placed as backfill. In the second pass, the trench is filled completely and the backfill flooded again. Backfill is heaped and excess material dispersed over the right-of-way to complete the operation. The scarcity of water for backfilling made it necessary to install a pump, capable of operating through a 550-foot head, and 4 and 6-inch pipe headers throughout the job to supply water for compaction.

Personnel

The job is moving ahead steadily at the rate of about eight joints per day in the concrete portion and eight 32-foot joints on steel, and project officials expect everything except cleanup work to be complete by December 1. Field work for MWD is being handled under the general supervision of R. B. Deimer, chief engineer. For Freeway Constructors, Paul Ban is general superintendent. He is assisted by his father, Nick Ban, a veteran pipeline builder for the company, who is in charge of pipelaying. Frank Lemon is excavation foreman and Ken Moile supervises the welding of steel pipe.

THE END

Cleveland Formgrader names new president

The new president of Cleveland Formgrader Co., Mills Road, Avon, Ohio, is Glen Mooney. Mr. Mooney was formerly associated with Truscon Laboratories, Detroit, Mich., as general sales manager.

Asphalt Institute offers fellowship, research plan

Steps to help alleviate the shortage of young graduate civil engineers and to intensify research and development in the field of asphalt-mix designs were taken by The Asphalt Institute this past summer at its semiannual meeting in Colorado Springs, Colo.

The Institute created the first Bernard E. Gray Fellowship in asphalt technology at its host school, the University of Maryland. The fellowship, named for the immediate past president of the Institute, is expected to be the first of several to be established at qualified engineering schools throughout the nation.

Anticipating a record boom in highway construction in the next few years, the Institute's board of directors approved and gave top priority to an intensified research and development program with emphasis on improved asphalt-mix designs. Other subjects of the program will include the use of asphalt in soil stabilization, thickness design for flexible pavements, airfield paving for the jet age, and the use of asphalt in hydraulic engineering.

Corps of Engineers' jobs in the New York area

The need for competent junior engineers and other professional assistants to fill vacancies on engineering and construction projects in and around the metropolitan New York area continues, according to an announcement from the office of the district engineer, U. S. Army Corps of Engineers.

Positions range from civil engineering aids through inspectors to construction engineers.

Interested persons desiring further information and full particulars regarding the work of the Corps of Engineers should communicate with the Personnel Branch, U. S. Army Corps of Engineers, New York District, 111 E. 16th St., New York 3, N. Y.

American-Marietta elects Troxell a vice president

R. L. Troxell, chief engineer of the American-Marietta Co. since 1945, has been elected a vice president of the Chicago, Ill., firm. He will continue in administrative charge of the engineering department, but will devote the major portion of his time to management work in the headquarters office.

The firm's engineering department has been divided into three sections, with Robert Wolf as senior engineer in charge of architectural and structural engineering, John Baggott as senior engineer in charge of mechanical and electrical engineering, and Lewis C. Knight as senior engineer in charge of process and material-handling engineering.

White Motor Co. appoints

The new general sales manager of the truck division of The White Motor Co. is P. E. Tobin. Formerly North Atlantic Regional manager for White in New York City, Mr. Tobin will make his headquarters in Cleveland, Ohio. He will be responsible for all field operations, as well as for sales and service activities of the truck division.

A-C assigns manager to Cincinnati district

The new manager of the Cincinnati district of the general machinery division of Allis-Chalmers Mfg. Co., Milwaukee, Wis., is R. B. Fulton. Mr. Fulton, who has represented the company in the Pittsburgh and Detroit districts, was a representative in the Cincinnati district prior to his present appointment. He succeeds W. F. Daly, who has retired.

NO OTHER chassis lubricant gives long-lasting protection like *Texaco Marfak*. When you "gun" it into a bearing, it stays there. Heavy loads won't squeeze it out. Shock loads won't jolt it out. In addition, *Texaco Marfak* seals out abrasive dirt and keeps metal coated with a moisture-proof film that prevents rust. Chassis parts last longer, equipment stays on the job, maintenance costs come down.

In wheel bearings, *Texaco Marfak Heavy Duty* offers the same fine protection. It provides effective lubrication inside the bearing, but retains its original tough consistency at the outer edges — sealing out dirt and moisture, sealing itself in. This assures not only much longer lasting protection, but safer braking. No seasonal change is required.

NEW MULTI-PURPOSE MARFAK

Texaco Marfak Heavy Duty Special is the new, lithium-base, multi-purpose member of the famous Marfak family — especially designed for those who want *just one lubricant* to handle all chassis, wheel bearing, water pump and other lubrication. *Texaco Marfak Heavy Duty Special* pumps easily even at winter temperatures and lubricates effectively regardless of the thermometer. It resists water washing and stands up in the severest service.

MORE THAN 555 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD

For transmissions and differentials, use *Texaco Universal Gear Lubricant*. It assures smoother, quieter meshing, extends gear life and reduces maintenance costs.

For crawler tracks, use *Texaco Track Roll Lubricant*. It acts to keep dust, mud and water away from the bearings, assuring their long life and trouble-free operation.

A Texaco Lubrication Engineer will gladly help you simplify your maintenance lubrication for greater efficiency and economy all around. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

This Diamond rock-crushing plant, set up in a dry wash near the job site, produced the leveling-course material which topped out the granular subbase on the road job. The unit includes a 10 x 36 jaw crusher and a set of 20 x 30 rolls.

Flat-lift dumping spee sub

Four Euclid single-power scrapers assigned to a 7.87-mile subbase job in southern Arizona racked up a production score of 500 tons per hour for the contractor, W. J. Henson, Prescott, Ariz. And speed wasn't the only virtue of this application; the flat lifts of subbase material dumped by the four rigs proved both highly accurate and easy to handle.

Henson's $213,000 contract with the Arizona State Highway Department covered a section of U. S. 80 between Tucson and Benson and included, besides the subbase, an aggregate base course and 2 inches of plant-mix pavement waterproofed with a seal-coat.

Sizable tonnages were involved in the project. The select base has 92,000 tons of 3-inch-minus material. Aggregate base-course material totals 30,500 tons; mineral filler, approximately 21,300 tons. Asphaltic cement of 150 to 200 penetration is specified for the plant-mix job.

In gearing this subbase job to a production rate of 500 tons per hour, Henson overcame several obstacles threatening high production. A considerable amount of the subbase material could not be placed until three structures—two bridges and an underpass—had been completed by another contractor. Too, there were six pit sites in the select-base production job, and two pit sites for aggregate base-course production. The moves from one site to another tended to slow down over-all production.

Flexibility the answer

The four Euclid scrapers solved the problem for C. R. Joy, job superintendent for Henson. A judicious combination of long and short hauls gave the contractor flexibility in case one of the Euclids was laid up for repairs.

All of the grading on this stretch had been done in 1953 and 1954 by Pioneer Constructors, Inc., Tucson, and Wallace & Wallace, Phoenix. The grade was still in good shape, and a limited amount of blading by Henson's two Caterpillar No. 12's soon had the grade ready for the select base course. Joy analyzed his hauls, and found one-way distance figures of 2,600, 3,300, 4,100, and occasionally up to 6,900 feet. Average haul distances approximated 4,000 feet.

Under these conditions, Joy figured he could assign the "Eucs" simultaneously to long and short hauls by working both ends of a particular spread. Since his grizzly plant was capable of producing 500 tons per hour, he decided it would be advantageous to get all that material out on the road. The four Euclids, which

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ubbase work on highway

Scraper fleet places material at rate of 500 tons per hour to keep pace with grizzly-plant production

One of the four big Euclid scrapers used by W. J. Henson to put down subbase material dumps its load in a flat lift. By alternating the big rigs on long and short hauls, the contractor achieved excellent laydown production.

would haul 29 tons per trip and roll between 20 and 25 mph out to the point of dump, would handle the entire plant output so long as they all worked.

Some flexibility was needed, of course, in case one of the "Eucs" broke down, and that was where the combination of short and long hauls came in. As long as the four "Eucs" were working, at least two of the machines could do long-haul work. If one machine broke down, Joy could still hold one on long-haul work and use two on the end closest to the grizzly setup. In case two broke down —which fortunately didn't happen— he could put the remaining machines on short-haul work until all units were operating again.

So far as the grizzly plant was concerned, there was very little downtime during the project. The plant was a simple setup composed of stock parts, shop-assembled in Henson's home yard at Prescott. It consisted of an 80-foot conveyor with a 30-inch belt set at an approximate 3 to 1 slope, a sloping 3-inch grizzly which automatically separated plus-3-inch rock particles from the material as it passed off the end of the conveyor belt, and a 50-ton surge bin directly underneath. This surge bin was set down as low as possible by bulldozing a drive-through-type haul road deep and wide enough for the Euclid scrapers to enter and leave as speedily as possible.

A full-time dump man was stationed at the surge bin to get the "Eucs" filled as rapidly as possible. The plant was driven by a Caterpillar D13000 engine. Fed by three Caterpillar D8 dozers, this high-production grizzly setup was used in four of the six select pit locations. The pits were all located in natural dry gravelly water-courses of a type which intersect the project at many points.

After receiving their 29-ton-net loads, the Euclids were weighed before leaving the grizzly-plant area. Haul-road maintenance into these areas presented a problem, as banks leading down into the washes were steep, and in several cases rather sharp curves had to be built to ramp the roads down from the high roadway level. Fortunately, all four of Henson's Euclid operators were veterans with the company, and their judgment in the operation of that expensive equipment was dependable. The men used the necessary caution to avoid accidents, and still managed to keep production at a high level.

Of the six select pit sites, two allowed the use of native material without grizzly separation. In these places, the Euclids were loaded by push Cat, an HD-20, and a Cat D8 (double-headed). In any case, grizzly setup or no, nobody on the job worked harder than the three catskinners around this particular spread, who kept their

(Continued on next page)

With a FLECO Cab Guard and Treedozer

Here's a combination that will make your land clearing jobs more profitable: a Fleco Treedozer at the business end of your tractor—and a sturdy, all-steel Fleco Cab Guard protecting your operator.

FLECO TREEDOZER SPEEDS PRODUCTION 25% . . . in thickly forested areas with heavy undergrowth and large or small trees, a Fleco Treedozer can often help your tractor clear as much as 60% faster than a bulldozer. Independent Knockdown Beam is driven hard against the trees. The lever action bends the trees and partially tears loose root systems. The V-shaped plow then makes contact, getting under roots effectively and economically ripping the trees from the ground.

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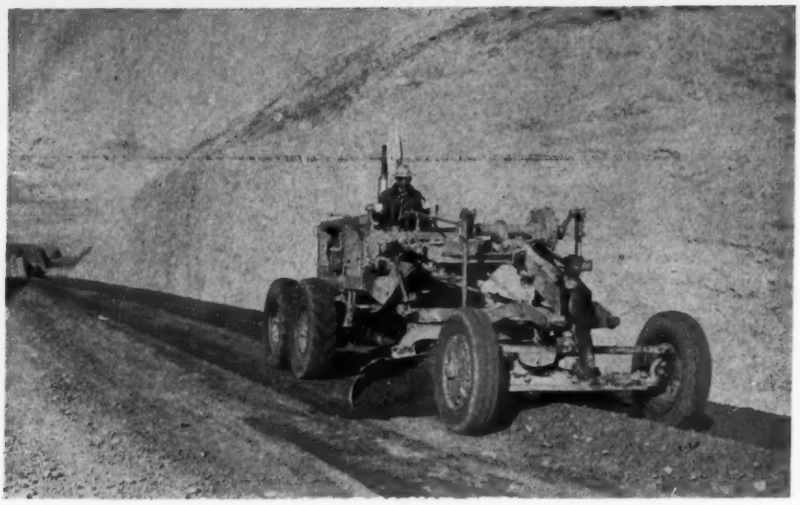

After water has been applied, a Caterpillar No. 12 motor grader blends the moisture into subbase rock. Because the scrapers placed the material in flat lifts, much blade-mixing was eliminated.

(Continued from preceding page)

tractors in the highest possible gear all the time to keep up with the fast-moving Euclids.

Laydown methods

The same imaginative thinking which governed production of the select material also carried through its placement. Henson's method of laying the material down in flat lifts, along with subsequent processing methods, delivered what one of the Arizona engineers on the job described as "the best subbase laydown I've seen in over ten years."

Since the Euclids will dump a flat lift of material approximately 14 feet wide, it required a minimum of blade work to make the spread in three passes. Plans and specifications called for select thickness of three types: 6 inch, 9 inch, and 12 inch. On 6-inch courses, the material was dumped in a single spread. On 9-inch courses, two 4½-inch lifts were made. The 12-inch course was made by placing and processing two separate 6-inch lifts.

One of the principal advantages of the bottom-dump method of placing has been its tendency to spread the material much more accurately than would be possible with trucks. The method also eliminates a considerable portion of the early blade work which is necessary on a truck-dumped lift to knock the material down. Although nothing conclusive has been determined, there appears to be less segregation of coarse particles in the bottom-dumped lifts than in truck-dumped material. A field inspector was used on the Euclid-dumped material so that the spreads could be made to definite length and volume.

The processing of material was as well organized as any other part of the job. In general, the select subbase material came from the pit in powder-dry condition, so that a great deal of water was necessary. The water haul was somewhat complicated because of the average distance—about five miles. Henson therefore arranged water-hauling equipment around three units: a 5,000-gallon Sterling truck-mounted unit, and two 2,500-gallon 6×6 war-surplus truck-mounted units.

The first step in the processing of material, after one of the motor graders had made one leveling pass over a lift, was the application of necessary water. The water was usually added in two or three consecutive trips, after which both motor graders began blade-mixing the flat lifts. This was done for two reasons: to secure an even dispersion of moisture and to blend the material and remove any segregation which might exist. After a spread of material had been blended and watered to its optimum requirement, the motor graders began laying the windrow by cutting material off to one side. The lifts were laid out in the minimum thickness permitted by the size of rock particles. This operation was accompanied by continuous rolling applied by two

Barnes Pumps

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COMPLETING 645-MILE LAKEHEAD PIPELINE EXTENSION!

Barnes Self-Priming Pumps held down the water level in stream beds while wagon drills pierced rock for blasting. Wherever water was wanted or unwanted on the Lakehead Pipeline Extension — you saw Barnes Pumps working right along with the men — 12 hours a day — 6 days a week!

"ON SCHEDULE" — every contractor knows what that means! Here a Barnes 3-inch Pump, working under toughest conditions, is "on schedule" with Barnes dependability and performance! Laying 645 miles of 30-inch pipe from the lakehead ports of Duluth and Superior across Northern Wisconsin and Upper Michigan, under the Strait of Mackinac, southeasterly across Michigan and under the St. Clair River to Sarnia, Ont., was rugged work! And *Barnes makes rugged pumps* — for rugged work — in rugged terrain — *to keep rugged schedules!* When the going is tough, call for Barnes Self-Priming Centrifugal Pumps. See your distributor or write Barnes about your problem — there's a Barnes Pump to solve it!

Barnes has a pump for every pumping need — from 1,000 to 90,000 gph. capacities. Choice of Gasoline, Diesel, Electric or Pulley Drives.

FOUNDED 1845 Barnes MANUFACTURING CO. MANSFIELD, OHIO

BARNES MANUFACTURING CO.

Mansfield, Ohio Oakland 21, Calif.

Grace oscillating-wheel pneumatic machines pulled by International rubber-tire tractors.

Extra compaction was developed on this job by again using the Euclids to excellent advantage. Fully loaded, these units have a gross weight of about 57 tons. The big rubber tires on these scrapers offer the possibility —if used intelligently—of developing some of the finest densities obtainable with any type of equipment. State and contractor's men therefore worked in close cooperation with each other, so that the loaded and empty Euclids were routed as much as possible over different portions of the roadway each trip.

Topping out the 6 to 12-inch base material is 3 inches of aggregate base course that contains 1-inch-minus crushed rock. This material was produced from two pit setups by a Diamond crushing plant, fed by two Caterpillar D8 dozers. Principal components of this plant include a 10 × 36 jaw crusher, a set of 20 × 30 rolls, and a twin-deck vibrating screen. The plant has produced as high as 225 tons per hour in 1-inch-minus crushing when not too much of the raw material required routing through the crushers. When oversize rock which needed crushing reached the 30 to 50 per cent range, production dropped off to as low as 200 tons per hour. This Diamond plant also produced the mineral filler for the plant-mix pavement.

Processing and laydown of the aggregate base course was basically the same as that previously described. The same water-hauling and rolling methods were used. Following the final laydown and rolling of the aggregate base course, the surface was tight-bladed to make a smooth roadway and the leveling course sealed by an application of prime asphalt. Finally, a 40-foot-wide plant-mixed asphalt surface, 2 inches thick, was laid down in two 20-foot lanes to form the wearing surface. A seal coat over this strip and both 8-foot shoulders brought the section to modern standards.

Personnel

Design and supervision of the job was under the direction of George E. Lang, Arizona state highway engineer. He was assisted by C. B. Browning, deputy state highway engineer in charge of construction. Resident engineer was M. C. Livesay. C. R. Joy, job superintendent, was in charge of the assignment of machinery on select-base work, and Tom McNeely was in charge of the rock-crushing plant. THE END

Pneumatic compaction was accomplished with Grace oscillating-wheel rollers, such as this one being pulled by an International rubber-tire tractor. The Cat grader just ahead blends the lift of subbase material.

Stewart-Warner to buy John W. Hobbs Corp.

Stewart-Warner Corp., Chicago, Ill., will buy the entire business and assets of John W. Hobbs Corp., Springfield, Ill., under terms of a purchase agreement signed by officials of both companies.

No changes are expected to be made in the Hobbs organization.

HERE'S PROOF THAT A-W GRADERS WITH ALL-WHEEL DRIVE HAVE 30% MORE POWER AT THE BLADE

To calculate Power-at-the-Blade, it is necessary to determine (1) skid pull due to traction and (2) maximum rim pull due to engine; using the formulas at the right, which are those used by manufacturers of tires and farm tractors.

The *effective* Power-at-the-Blade will be the *lesser* of the two figures. If you have more power than is necessary, and insufficient weight on driving wheels, you will slip the wheels, making SKID PULL the *limiting factor*. If you have insufficient power to slip the wheels, RIM PULL due to engine will be the *limiting factor*.

SKID PULL (DUE TO TRACTION)

SKID PULL = W x f

W = WEIGHT ON DRIVERS

f = FRICTION COEFFICIENT BETWEEN TIRES AND GROUND

MAXIMUM RIM PULL (DUE TO ENGINE)

$$\text{RIM PULL} = \frac{T \times 12 \times R}{Y}$$

T = ENGINE TORQUE AT PEAK (INTERMITTENT RATING)

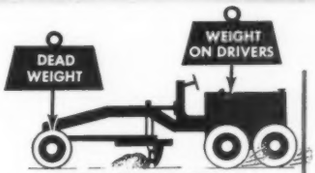
R = TOTAL RATIO, ENGINE TO REAR WHEELS

Y = LOADED RADIUS OF TIRE (INCHES)

EFFECTIVE POWER AT THE BLADE WILL BE THE LESSER OF THE ABOVE TWO FIGURES

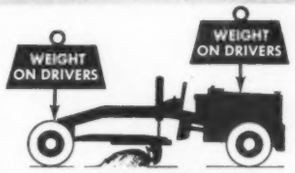
Working in average dirt in first or second gear, all graders have more than enough torque to spin their drivers; therefore Skid Pull is the limiting factor, and the measure of comparative performance. The Austin-Western Power Grader, with its exclusive All-Wheel Drive, has 30 per cent more weight on driving wheels than any other grader; consequently moves 30 per cent more material . . . it's as simple and inescapable as that.

HERE'S WHY A-W GRADERS DELIVER MAXIMUM POWER



REAR DRIVE ONLY

No grader with a dead front end can possibly deliver maximum power at the blade. Weight carried on the idling front wheels of the conventional tandem-drive grader is *dead* weight, contributing nothing to traction—*lazy* weight, consuming power to no purpose. Every pound of weight not carried on a driving wheel *handicaps your horsepower.*



ALL-WHEEL DRIVE

On the Austin-Western Power Grader there are no idling front wheels—no dead front end to consume power and decrease efficiency. Every pound of weight rides on a driving wheel. Every pound is working weight—contributing 100 per cent to traction, utilizing the torque of the engine to best advantage, delivering maximum power where it counts—*at the blade.*

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Power Graders · Motor Sweepers

Road Rollers · Hydraulic Cranes

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NAMES IN THE NEWS

H. Fred Waller receives highway service award

The D. B. McCrary award for outstanding service to the North Carolina State Highway Commission has been awarded to H. Fred Waller, Jr., laboratory supervisor of the bituminous research department. In addition to research on bituminous paving, Mr. Waller has designed and revised testing equipment, analyzed results, and formulated tests to standardize the design of bituminous mixes.

The McCrary Award, begun in 1945, was authorized by highway employees to honor the late D. B. McCrary, highway chairman from 1941 to 1943. The award, which was to be given every year for ten years, recognizes one employee for his outstanding and meritorious achievement.

Mr. Waller received his B.S. degree in general engineering from North Carolina State College. He is a member of the Raleigh Engineers Club, the North Carolina Society of Engineers, and the American Society of Military Engineers.

Allison C. Neff elected president of NSPE

At the annual banquet of the National Society of Professional Engineers in Philadelphia, Pa., Allison C. Neff, vice president of Armco Drainage & Metal Products, Inc., Middletown, Ohio, was named president of the organization. He succeeds Clarence T. Shoch as president.

A former vice president of the Ohio Highway and Turnpike Association, Mr. Neff is also past president of both the Cleveland and the Ohio Societies of Professional Engineers, a past national director of the NSPE, a member of the engineering society of Cincinnati and the Professional Engineers Conference Board for Industry.

Those elected vice presidents, and their respective regions are: Louis F. Frazza, Johns Manville Sales Corp., northeastern region vice president; Warner Howe, Gardner & Howe, southeastern region vice president; Robert J. Rhinehart, Arkansas Power & Light Co., southwestern region; Lindley R. Durkee, Housing & Home Finance Agency, western region; Garvin H. Dyer, Missouri Water Co., north-central region; and Virgil E. Gunlock, Chicago Transit Board, central region. Russel B. Allen, professor of civil engineering at the University of Maryland, was elected treasurer.

Name vice president for Brown & Root, Inc.

The chief engineer for Brown & Root, Inc., M. P. Anderson, has been made a vice president of the firm.

With the Houston, Texas, firm for the past 18 years, Mr. Anderson has been responsible for the company's entire design and construction engineering activities as chief engineer. During the war, he was chief engineer for Brown Shipbuilding Corp., having charge of design and construction at the Brown shipyards.

Before joining the organization, he was in charge of construction plant design on the Grand Coulee Dam, was engineer on the Norris Dam for TVA, was valuation engineer for the South Carolina Power Co., and construction engineer on hydroelectric plants in Georgia and Alabama.

H. F. Roemmele heads N. Y. engineer group

The New York State Society of Professional Engineers has elected Herbert F. Roemmele president of the organization for the 1955-56 year. Presently dean of students at The Cooper Union, Mr. Roemmele has been active in the professional engineering movement since 1934. He succeeds Thomas M. Linville in office.

Elected along with Mr. Roemmele were: Lewis J. Sforzini, first vice president; Franklin J. Johnson, second vice president; Patrick M. Corry, treasurer; and Richard B. Richardson, financial secretary.

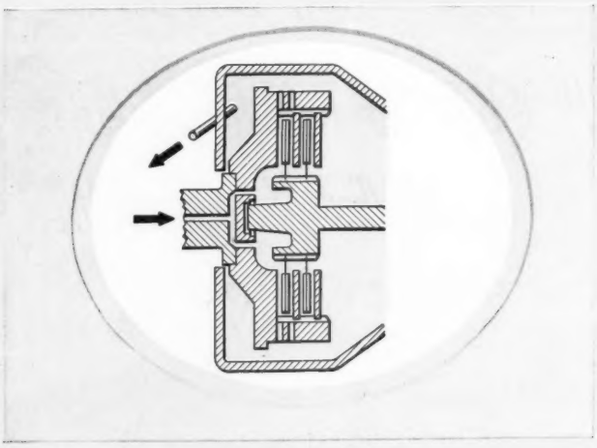
W. G. Kirkland is named to AISI engineering post

The American Iron & Steel Institute has appointed William G. Kirkland to the post of consulting engineer. Mr. Kirkland succeeds Bert L. Wood who is retiring.

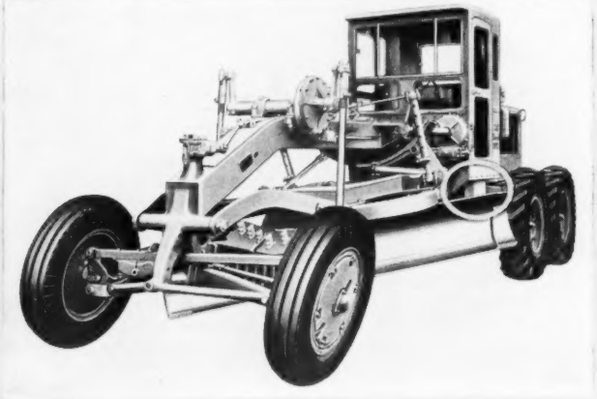
Before joining the Institute in 1947, Mr. Kirkland was an engineer in private industry and with both federal and municipal governments.

CATERPILLAR ANNOUNCES ANOTHER "FIRST":

NEW OIL CLUTCH for the NO. 12 MOTOR GRADER



Arrows show path of oil through housing with clutch disengaged. Facings remain cool and bathed in oil, which is carried to outlet at top by flywheel ring gear. The two steel clutch discs and clutch brake are faced with pressure-processed cork, which gives an excellent coefficiency of friction and long wear.



The new oil clutch for the No. 12 Motor Grader gives you the same reliability and improved performance as the thoroughly job-proved oil clutch in Caterpillar track-type Tractors. Rugged and reliable, it uses oil from the engine lubrication system. Here are some of the things the new oil clutch for the CAT* No. 12 can mean to *you:*

LONGER WORK LIFE—In actual on-the-job tests, clutch facings wear less than the thickness of a human hair in one thousand hours' operation! Thick clutch facings mean that work life is extended thousands of hours before discs need be replaced. And constant "oil bath" lubrication reduces wear on all moving parts.

LESS MAINTENANCE—Adjustment every 1500 hours is not unusual, after initial "break in." This is equivalent to nearly nine months without adjustment on road maintenance work! No external lubrication is needed: internal oil system lubricates pilot and throwout bearings.

GREATER EFFICIENCY—The clutch is constantly cooled, never exceeding normal engine oil temperature. This practically eliminates clutch fade, greatly reduces slippage due to overheating, and means that the clutch retains "like new" operation for thousands of hours.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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99% OF ALL CAT MOTOR GRADERS ARE STILL IN USE

Michael A. Spronck, recently appointed administrative assistant to Dr. David B. Steinman, consulting engineer and bridge designer.

Michael A. Spronck joins D. B. Steinman staff

A former associate editor of CONTRACTORS AND ENGINEERS, Michael A. Spronck, has joined the staff of Dr. David B. Steinman, consulting engineer and bridge designer of New York, N. Y., as administrative assistant. Prior to his present position, Mr. Spronck was associated with a Conover-Mast publication.

Dr. Steinman was recently awarded the International Grand Prize of Invention for his contributions and achievements in bridge design and construction. He is the first recipient of the award, the highest offered by the Permanent Committee of the Grand Prix International de l'Invention.

Public-works official retires from state service

Charles R. Waters, district engineer for the New York State Department of Public Works at Buffalo, has retired after almost 30 years of service. Planning to remain in the field of highway engineering and transportation, Mr. Waters is considering opening an office for the practice of professional engineering.

Mr. Waters was a deputy in the office of the state engineer and surveyor at Albany prior to being district engineer. Before that, he was engineer-in-charge of highway and canal-construction projects.

He has specialized in concrete and asphaltic pavement construction; in arterial planning in cities; in the design, manufacture, and reconditioning of highway signs; and in the subject of uniformity of signs and pavement markings throughout the country.

Atlas Powder executive, Harry L. Moat, dies

Harry L. Moat, director of production for the explosives department of the Atlas Powder Co., Wilmington, Del., died unexpectedly June 12 at his home in Wilmington. He was 58 years old.

A native of Catasaqua, Pa., Mr. Moat had been with Atlas since 1918. He was a member of the American Ordnance Association and other professional societies.

Shifts made in personnel by Corps of Engineers

The U. S. Army Corps of Engineers has made a series of changes in assignments to the Galveston District, North Central Division, South Pacific Division, and the South Atlantic Division.

Brig. Gen. Charles G. Holle, division engineer of the South Atlantic Division, Atlanta Ga., has been assigned to the Office, Chief of Engineers, Washington, D. C. Col. William F. Cassidy has been made Division Engineer, South Pacific Division, replacing Col. Paul D. Berrigan, who will head the North Central Division. Col. Berrigan succeeds Col. Wendell P. Trower, who has retired.

The Galveston District, Galveston, Texas, has abolished its Houston area office and Port Lavaca subarea office, and has reduced field-office personnel at Port Arthur. Functions of the Houston area office will be combined with those of the Galveston area office. Lt. Col. Herbert Richardson, Jr., executive officer of the district, has been relieved of his post and will report for duty at the U. S. Military Academy, West Point, N. Y.

Asphalt Institute engineer

The district engineer for The Asphalt Institute, College Park, Md., in Alabama and Tennessee is John B. Dunbar. A graduate of Alabama Polytechnic Institute, and formerly with the Alabama Highway Department, he will have headquarters at Montgomery, Ala.

Western district manager named by H. K. Ferguson

The vice president and director of the H. K. Ferguson Co. of Cleveland, Ohio, John B. Kirkpatrick, has been appointed manager of the company's western district. From his new headquarters in San Francisco, Mr. Kirkpatrick will direct work in ten western states. He succeeds C. J. Haglund, who has resigned.

Mr. Kirkpatrick, who formerly worked for Morrison-Knudsen Co., Inc., Boise, Idaho, joined H. K. Ferguson in 1950. He directed all Ferguson's sales activities for several years and most recently was in charge of developing and revising those policies which would affect company operations.

Route 4A Illinois Highway, between Lockport and Joliet, Ill. Contractors: Powers-Thompson Construction Co., Joliet, Ill.

Here's a highway with built-in **"winter resistance"**

Rugged winter weather holds no threat for this new section of highway because the concrete was made with Atlas Duraplastic* air-entraining portland cement. Atlas Duraplastic cement gives concrete greater durability... fortifies it against freezing-thawing weather and prevents scaling caused by de-icing salts.

Atlas Duraplastic cement also aids fast, easy placement. It gives proper air content for uniform performance... makes a more plastic, more cohesive concrete that dumps, spreads and finishes easily. Bleeding is minimized, permitting finishing closer to the paver and earlier protection for curing.

YET DURAPLASTIC COSTS NO MORE than regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, New York.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

**"Duraplastic" is the registered trade-mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company*

ATLAS® **DURAPLASTIC**

AIR-ENTRAINING PORTLAND CEMENT

CE-D-175

A UNIVERSAL ATLAS PRODUCT

Makes Better Concrete at No Extra Cost

UNITED STATES STEEL HOUR—Televised alternate weeks—See your newspaper for time and station

Trailers lined up in neat rows like this make a construction camp a pleasant living area. Television, electric washing machines, and other conveniences are part of the picture, too—there is no roughing it in these up-to-date mobile camps.
C&E Staff Photos

Mobile housing:

Boon to modern construction

Economical, easily moved, and an aid to efficiency, the trailer camp is a familiar sight on big projects

That America is "a nation on wheels" is true not only as far as travel is concerned, but increasingly so with regard to housing as well. It is estimated that some 2 million persons throughout the country live in mobile homes. Half that number, are mobile workers; of these, a good percentage are construction men and their families.

The large-scale contractor of today has discovered that the housing of his crews for the length of a project can be an item of major importance in his over-all job picture. On such big projects as dams, bridges, highways, pipelines, ore processing and atomic energy plants, and airports, preparation of the site has often included setting up a trailer park to accommodate the mobile homes of thousands of workers and their families.

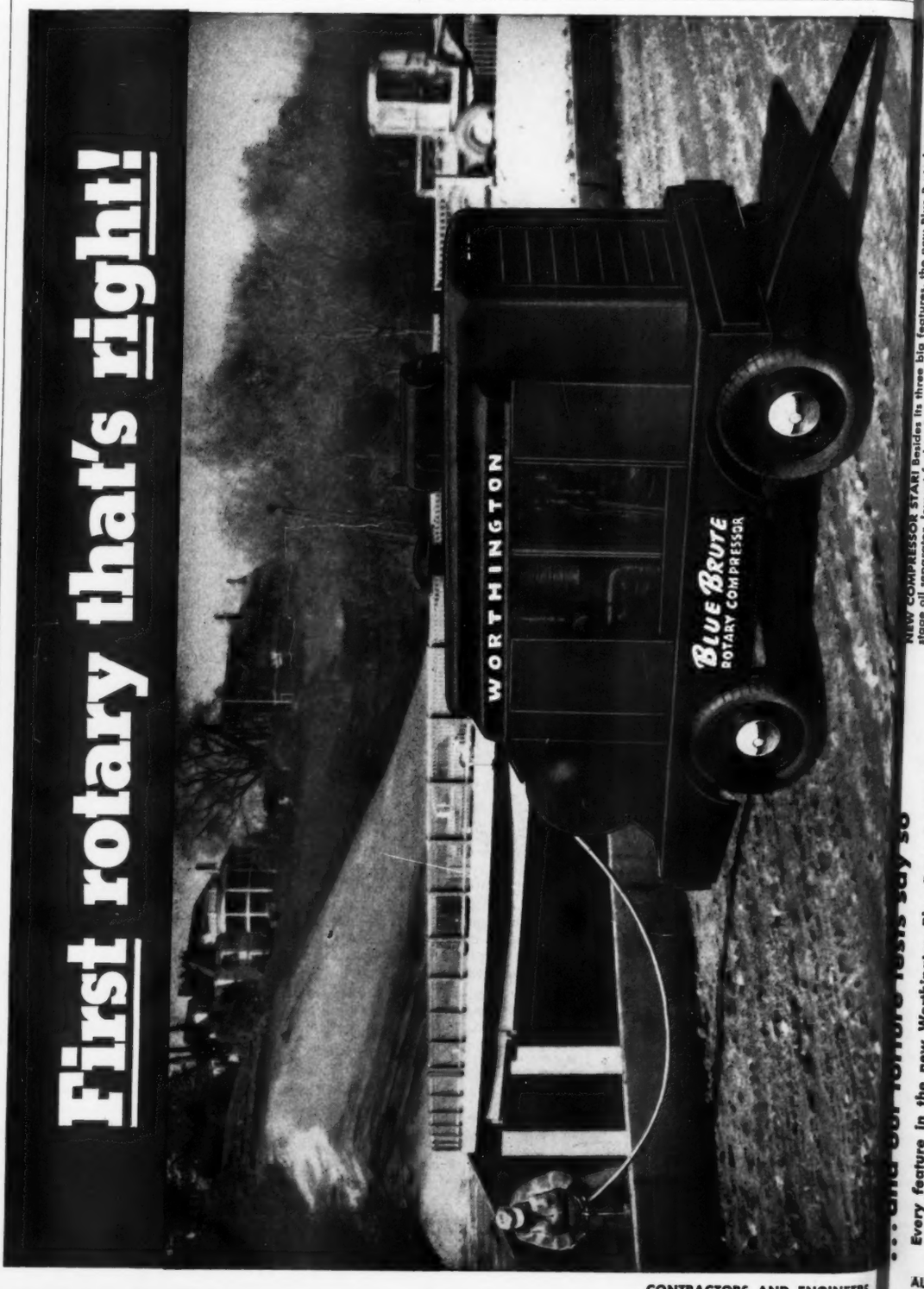
Contractors who have had experience with these trailer camps report that mobile housing not only takes care of the problems of living quarters for their workers, but has a good effect on crews' morale as well. Workers who can spend their off hours with their families and enjoy home cooking are bound to be a more satisfied —hence more efficient—lot.

The convenience and economy of mobile housing on the construction project must be mentioned, too. It is a simple task to move an entire crew and their families from one job to another, and a trailer park complete with running water, electricity, and other facilities can be set up in one day at a new project site. The contractor's heavy earthmoving equipment can grade the park in a matter of hours, and generators, water-supply tank trucks, and other temporary facilities can be hauled in and set up for operation.

Long trips by bus or auto to the nearest city, lonely hours in rooming houses or a steady diet of bars and movies for relaxation, and time-consuming trips to see the family—all these are a thing of the past for the modern construction worker who brings his family along with him when he takes a job.

Atomic energy plants

Atomic energy plants are among construction projects requiring huge



NEW COMPRESSOR STAR! Besides its three big features, the new Blue Brute boasts a two-stage oil separator, low-set fuel tank, separate air and oil tanks, and shorter wheel base. It all adds up to the sturdiest, easiest-to-use, most *practical* rotary yet.

... and our customers say so

Every feature in the new Worthington Blue Brute Rotary has been proved and re-proved by many months of the most grueling tests we

All the comforts—and joys—of home life are present for James Skaggs, pipeline construction worker for H. C. Price Co., Bartlesville, Okla., as he enjoys a meal with his wife and their two sons in the Skaggs trailer home.

Single men and those without their families along on the job may sleep in a mobile barracks building and eat in a dining trailer like this one. They, too, enjoy the home-cooked meals that the trailer camp setup provides.

crews of workmen, and trailer camps have solved the worker housing problem on several of these big jobs. At Portsmouth, Ohio, nearly 16,000 persons were housed in some 5,000 mobile homes during peak construction on the plant there. Many other workers on steam generating plant projects nearby also occupied trailer homes.

According to Robert E. Rose, assistant to the AEC manager for community affairs in the area, the contractor figured his costs would be considerably higher if he had to erect temporary homes for these workers. Also the trailers came completely furnished, whereas temporary housing would have required purchasing and moving in furniture.

At the Savannah River plant near Aiken, S. C., an estimated 11,609 mobile homes were in use at one time. One 70-acre site accommodating 1,239 trailers was cleared in short order when the project was complete. Instead of a residue of tumble-down tar-paper houses, the site now contains only the sewer, power, and water facilities that were installed to serve the trailer camp.

In Puerto Rico, a heavy-construction firm housed key personnel and their families in trailers during work on the Ramey Air Force Base. The trailers were shipped to Puerto Rico in the holds of ships, and transported overland on railroad flat cars.

The Chicago Bridge & Iron Co., Chicago, Ill., also is housing key personnel and their families in trailers at the sites of oil tanks, refineries, and pipelines in Venezuela.

And so it goes. Over 600 mobile homes housed workers on the McNary Dam project near Umatilla, Oreg. In Minnesota, where taconite mining areas, processing plants, and shipping facilities are being built, workers on half a dozen projects are living—together with their families—in mobile camps of as many as 600 trailers.

These examples — and there are many more—illustrate the fact that mobile construction camps represent low-cost housing and worker satisfaction on any kind of heavy-construction project.

It is not unlikely that mobile construction camps will one day be as indispensable as the repair shop on major construction projects.

THE END

... and our torture tests say so

Every feature in the new Worthington Blue Brute Rotary has been proved and re-proved by many months of the most grueling tests we could dream up. Actually, that test period represents a span longer than the service life of the average compressor.

This powerful new rotary is ready now with *all* the features you want. Look below for three of the most important ones.

NEW COMPRESSOR START Besides its three big features, the new Blue Brute boasts a two-stage oil separator, low-set fuel tank, separate air and oil tanks, and shorter wheel base. It all adds up to the sturdiest, easiest-to-use, most *practical* rotary yet.

FULLY SELF-DRAINING COMPRESSOR eliminates settling of oil and water in cylinders, inter-stage chamber or discharge. The Blue Brute's unique cylinder arrangement gravity-drains *all* oil and moisture during shutdowns. Never any gummy accumulation to damage blades on cold starts.

EASY-ACTING RELIABLE CLUTCH lets you warm up the engine *before* you cut in the compressor. Result: less wear and tear, quick starts *all* the time. Symmetrical clutch also assures vibrationless operation at all speeds and acts as safety connection between engine and compressor in case of serious malfunction of either.

QUICK, EASY INSPECTION. For example, an unskilled mechanic can replace a rotor blade in a jiffy — right in the field! Photos tell story of speedy blade removal. (1) Take out machine bolts and remove bearing cap . . . with needle bearing in place. (2) End plate is removed without disturbing inner-bearing race on rotor shaft. (3) Rotor blade removed for inspection or replacement. That's all there is to it!

If you haven't seen the new Blue Brute Rotary yet — see it now at your Worthington distributor's. Or write for Bulletin to Worthington Corporation, Section H.4.18, Harrison, N.J.

WORTHINGTON

IF IT'S A CONSTRUCTION JOB, IT'S A *Blue Brute* JOB

ROCK DRILLS • WAGON DRILLS • PAVERS • CONCRETE MIXERS • PORTABLE PUMPS

Equipment cuts six weeks off big earthmoving job

Push-loaded by a Caterpillar D8, a Cat DW20 picks up dirt and rock in one of the cuts on the Black Canyon Highway. The new roadway is 42 feet wide in cut sections and 39.4 feet wide on the fills.

Ray Day Photos

Two contracts—one for grading and one for base-course paving—are helping to bring the latest work on Arizona's Black Canyon Highway swiftly to completion in the mountainous country 70 miles north of Phoenix. From the very beginning, both these jobs on the north-south route between Prescott and Flagstaff encountered difficulties which periodically harassed other contractors working on the road.

Construction of the highway was started more than a decade ago, and has been continued at a fairly steady pace, the work being done whenever the state had money to let a contract. Earlier jobs were secondary, but the design standards were such that the road has been included in the federal-aid primary system. The road is numbered State Route 69 to Cordes Junction, and State Route 79 from there into the Verde Valley and Flagstaff. Route 69 continues from Cordes Junction into Prescott.

The road is modern, with permanent alignment, and—while it is a mountain highway—has long tangent stretches. Curves are gentle and grades are at a 6 per cent maximum. Construction has been of the stage type to allow for future work. Subgrade compaction is permanent, and the select granular base and aggregate base course are considered strong enough to hold traffic for many years. Paving consists of a single asphalt-penetration treatment with a seal coat of asphalt and a sand blotter cushion. This will give good service at moderate cost and permit a plant-mix surface to be put down to meet future traffic demands.

Tough grading

Under the excavation contract on the newest stretch of highway, Wallace & Wallace, Phoenix, made a 2.153-mile path for the road from the lonely mountain escarpments in the high country near Copper Saddle toward Verde Basin. In moving 570,000 cubic yards of earth and rock, Wallace & Wallace used almost a half million pounds of high explosives, chopped 1½ months off its own ambitious time schedule, and finished the work in June.

This was an undertaking calling for skilled men, the best of equipment, imaginative methods, and economical short cuts. Cuts and fills were extreme, the deepest cut measuring 130 feet.

EUCLID invites you to

GENERAL MOTORS
powerama
THE WORLD'S FAIR OF POWER
Soldier Field • Chicago, Illinois
August 31st through Sept. 25th

POWERAMA — biggest show of its kind ever presented — will portray the importance of diesel and gas turbine power to our industrial economy. There'll be entertainment and interesting exhibits for everyone . . . big stage shows, displays and working exhibits including a U. S. submarine, marine craft, a saw mill, cotton gin, oil drilling rig, Army tanks, diesel locomotive and a completely new high speed train, airplanes, "dream cars," and huge earth moving equipment.

Euclid will demonstrate its complete line of diesel powered equipment. The new TC-12 Twin Crawler Tractor with a total of 388 h.p., rear-dump and bottom-dump hauling units of 10 to 50-ton capacity, and several new scrapers will dramatize the use of diesel power in mining and construction.

Plan to visit this interesting exposition—we hope to see you there!

GENERAL MOTORS powerama THE WORLD'S FAIR OF POWER

EUCLID DIVISION • GENERAL MOTORS CORP. • Cleveland 17, Ohio

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FOR MOVING EARTH, ROCK, COAL AND ORE

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Cuts and fills for 2-mile stretch involve 570,000 yards of material; base course and blacktop are put down on 18-mile section of road

On the 18-mile base-course and paving job, a Caterpillar DW20 loads rock which the experimental D8 in the background (left) loosened with a heavy-duty ripper.

Working in materials which varied from dirt and loose conglomerate through a wide range of malpais, volcanic cinder pockets, decomposed granite, and cemented conglomerate, the firm's crews built a 42-foot-wide roadway in cut sections and a 39.4-foot roadway on the fills. This work, carried on even in temperatures which hovered near the zero mark last winter, prepared the stretch for the 36-foot paved surface, the center 24 feet of which will make a first-class two-lane highway.

Working under the supervision of general superintendent Clyde A. Thomas, crews and equipment were scattered all over the mountain ridges and valleys. The 12 Caterpillar D8 tractors on the job included a new experimental Series E supercharged model of the D8. This has seven track rollers, and at full speed its engine develops 260 horsepower. Most of the D8's were equipped with U-type dozers, and with power takeoffs at the rear for handling auxiliary equipment like the Caterpillar 28 and the Wooldridge 31 rippers used to loosen tough formations.

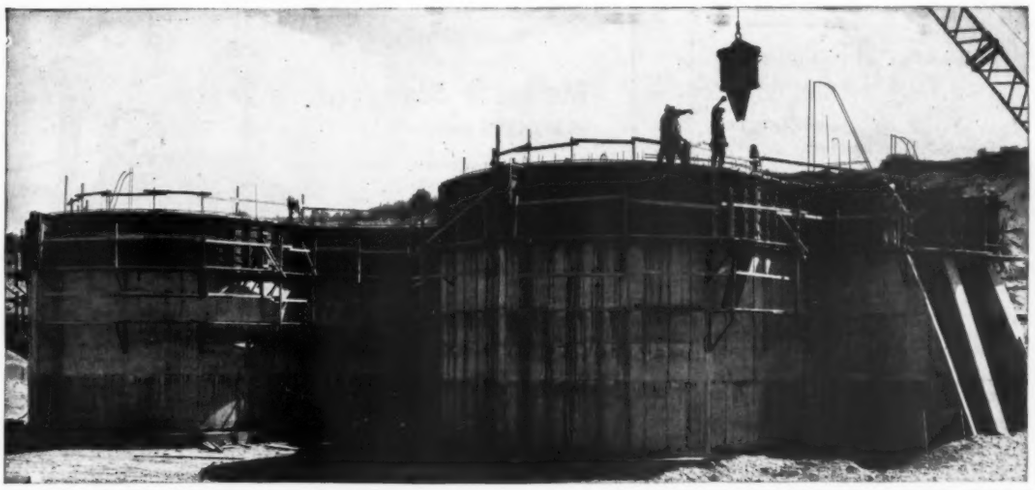
Early pioneering was particularly rugged, since in many places the right-of-way was on steep mountainsides—places where power equipment had never gone before. Despite this, dozers went up the hillsides, pioneering roads for compressors and drilling equipment.

In dirt or loose conglomerate, the machines worked steadily, but where ripping was necessary, their progress was slower. The experimental D8 gave an excellent account of itself on some pioneering work with a ripper. Heavily counterweighted, the rig could back up with the ripper in places where conventional equipment would have found it impossible to maneuver. In some cases, dozers had to have fuel and lubricants carried to the site by workmen for a number of days before conventional service trucks found it possible to reach the machines.

In the 130-foot cut, Superintendent Thomas and his crews expected to have tough going before work was finished. But after the machines got through the malpais they encountered a softer formation, and 30 feet from final grade the rock was so seamed and blocky from heat cracks that two rippers and Euclid scrapers were used to finish out the cut.

Other parts of the job started out

(*Continued on next page*)



STORAGE WALLS to hold sand and gravel, designed and engineered by Kaiser Engineering Co. Symons Pre-Fab Fir Plywood Forms were called upon for the work because they could be prefabricated to fit the need and on the basis of savings in time and money. Butler Construction & Engineering Co., Seattle, Washington, is the contractor.

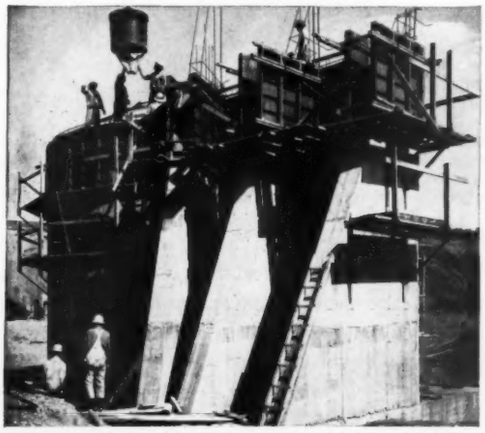
COST SAVINGS SELL SYMONS FIR PLYWOOD FORMS FOR 40 FT. HIGH "S" CURVED CONCRETE STORAGE WALLS

An unusual concrete construction job in Steilacoom City, Washington, involved the erection of two sharply curving free-standing concrete walls 40 feet high and 15 inches thick. The curves are shaped to a radius of 15 feet 6 inches. One wall is 190 feet long and the other is 400 feet long. They face each other across a space of 200 feet.

The curving surface of the walls posed a serious problem in forming. This was solved by the use of Symons Pre-Fab Fir Plywood Forms.

Most of the form panels were 2 x 6 feet with ¾ inch exterior *Plyform* faces framed on the edges with 2 x 4's and reinforced with steel cross members spaced 12 inches O.C. The job also required a number of filler panels 20 inches by 6 feet in which the plywood facing on each side extended past the framing 1¼ inches, making it possible for the edges of the form to butt closely on the outside surface of the curves.

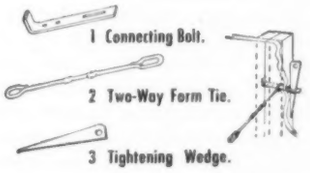
Symons Engineering and Customer Service also play an important role in projects where forming is a serious problem. The Symons Engineering Staff will furnish complete form layouts and job cost sheets on the form work—at no charge to the contractor. This service enables the contractor to get a clear picture of his job (its cost, bill of materials and labor saving methods). Symons fieldmen give regular on-the-job service. First, by on-the-job recommendations of forms and hardware needed. Second, by showing the workmen how to set up the forms efficiently. Third, by making special deliveries when last minute problems arise.



Abutment supporting ends of the 190-foot concrete sand and storage wall. Photo shows Symons Fir Plywood Forms being used for fourth pour on 40-foot high installation.

Symons Forming System includes just 3 pieces. TWO WAY FORM TIE which holds form securely to the required wall thickness without washers, spreaders or walers. Tie-ends are broken back within wall by a half-twist after forms are removed. TIGHTENING WEDGE is inserted through the slot in the connecting bolt and pulls form sides tightly together. CONNECTING BOLT which is slotted passes through edges of adjacent forms and tie loop.

JUST 3 PIECES



The Symons Forms are available on a Rental-Purchase Plan which offers contractors the opportunity to use the Symons Forming System on a rental basis . . . with all rental charges to apply on the purchase price, during a 60-day period.

Contractors throughout the country have tried this plan and like it. Send in your request for the complete facts—no charge or obligation.

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Broken rock from a deep cut is loaded into a waiting Euclid 15-yard end-dump by a shovel with an Amsco 2½-yard dipper. *Ray Day Photo*

(Continued from preceding page)

easily, but before long rock proved so tough that it would have torn scraper equipment to pieces. In these cases, Thomas brought in compressors and drilling equipment.

Drilling and shooting

This equipment was centered around three Ingersoll-Rand 600-cfm compressors — both Gyro-Flo and Mobil-Air. There were four Ingersoll-Rand wagon drills and a Joy 4-inch rotary hammer-type machine on hand. Some of the secondary drilling was handled by two Ingersoll-Rand 105-cfm machines and six Thor jackhammers.

Digging and hauling equipment included two LeTourneau-Westinghouse FU scrapers and two W's. Four Euclid single-power scrapers also helped move a considerable amount of the yardage.

The shovel and truck spread consisted of a Northwest 80-D with an Amsco 2½-yard dipper, and four Euclid 15-yard end-dump trucks. Auxiliary machinery included two service trucks, a grease truck, a fuel truck, and Lincoln, Hobart, and Westinghouse welding equipment. Miscellaneous pumps and water-hauling equipment was also on hand, but as a general rule the broken rock was moved directly into the fills without moisture being added.

Wallace & Wallace used two general types of drilling. The Joy 4-inch machine with Joy tungsten carbide bits was used to bore 40-foot holes, 4 inches in diameter, on a hole pattern of 11 × 12 feet.

The second type of drilling was done with the Ingersoll-Rand wagon drills. These were used with Ingersoll-Rand drill steel having No. 3 threads and Timken tungsten-carbide drill bits 2½ inches in diameter. Hole centers put down by the wagon drills varied, depending on the formation. Tungsten-carbide drill bits were used to good advantage on the 30-foot maximum-length drill steel used by Wallace & Wallace.

Apache free-flowing powder was used in wagon-drill holes with one stick of gelatin, and one blasting cap set off the shots. On large-diameter holes drilled by the Joy machine, Apache 3 × 10-inch sticks of 40 per cent gelatin were used. All the holes were column loaded almost to the top of the ground. Millisecond delays helped to cut a neat line at the highway slopes and to reduce the fracture along that point. This will help to make future maintenance easier.

The scrapers and the truck fleet hauled the material from cuts into the fill location at a good rate of speed. Some sizable drain culverts—one of them of 7-foot-diameter Armco Multi-Plate pipe 300 feet long—were installed to finish the job. Altogether, a total of 130 men of various crafts worked on the job, and there was less than 2 per cent turnover of workmen, despite the remote location.

Subbase job

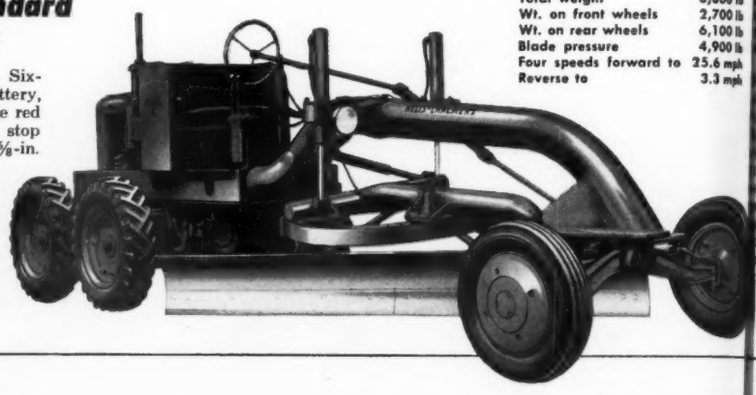
Catching up with the Wallace & Wallace job on the west end is a $319,000 contract for 18 miles of base course and paving. The contractor on this job is Phoenix-Tempe Stone Co., Phoenix, another veteran Arizona contracting firm. Principal quantities include the production and installation of 370,000 tons of select material, 57,000 tons of aggregate base course, and the installation of a single-course asphalt-penetration surface.

General superintendent W. J. Har-

Model D *Standard*
(GASOLINE ENGINE)

Standard Equipment: Six-volt electric generator, battery, two white headlights, one red combination rear and stop light, muffler, 10-ft by ⅝-in. moldboard, hydraulic controls for moldboard lift, four 7.50-20 (6 ply) rear and two 6.50-16 (6 ply) front pneumatic tires with regular tubes.

Total weight	8,800 lb
Wt. on front wheels	2,700 lb
Wt. on rear wheels	6,100 lb
Blade pressure	4,900 lb
Four speeds forward to	25.6 mph
Reverse to	3.3 mph

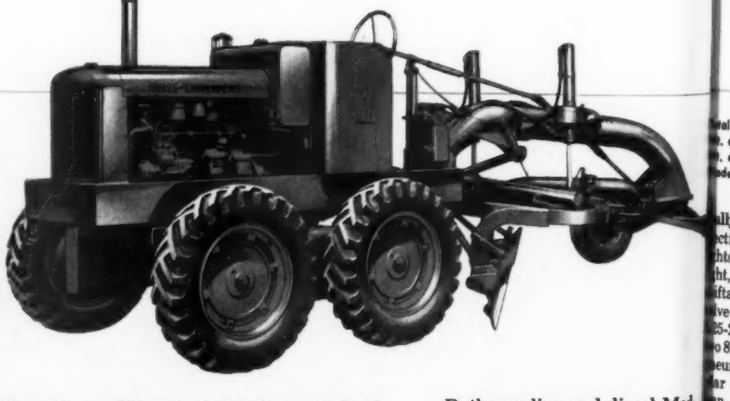


Match your grading needs with

from the Allis-Chalmers model D motor grader line

Model D Diesel *Standard*

Total weight	9,350 lb
Wt. on front wheels	2,760 lb
Wt. on rear wheels	6,590 lb
Blade pressure	4,900 lb
Four speeds forward to	25.2 mph
Reverse to	3.2 mph



Standard Equipment: Twelve-volt electric generator, battery, two white headlights, one red combination rear and stop light, muffler, 10-ft by ⅝-in. moldboard, hydraulic controls for moldboard lift, four 7.50-20 (6 ply) rear and two 6.50-16 (6 ply) front pneumatic tires with regular tubes.

Both gasoline and diesel Model D's are available with any combination of accessories.

You can still buy a Model D for one-third the cost of a large motor grader, and it's the most popular, most versatile small grader on the market. In addition to the units illustrated, the Model D is available with other combinations of accessories . . . or with any of these useful attachments: rear-mounted ⅝-cu-yd loader; shoulder maintainer; one-pass windrow eliminator; V or blade-type snowplows. Ask your nearby Allis-Chalmers dealer for a demonstration . . . and prove the Model D's value to yourself.

rison has some unique job conditions on this base-course work. Production of select material is being done with an average one-way haul of 3 miles, an extreme haul of 11 miles, and at five pit sites. This calls for fast long-range high-capacity hauling equipment.

A fleet of five Caterpillar DW20 scraper units with two Cat D8 pushers and the same D8 experimental ripper Cat which Wallace & Wallace used on the grading job is doing this work.

The select material in all five pits consists of a finely fractured rock—almost solid in places — which responds very well to a heavy-duty ripper. The material is being loaded out of the cuts and hauled to the job by the scrapers. There, it is spread in comparatively thin lifts and build up to an average 18 inches in thickness throughout most of the project. In some places, this material is thicker or thinner, depending on subgrade characteristics.

To help pulverize the oversize particles coming out of the pit behind the ripper, Harrison is using a double set of Gebhard 6-foot diameter sheepsfoot rollers pulled by a Caterpillar D8 tractor. A Pioneer portable crusher plant, working from two pit setups, is producing the aggregate base course. Even producing 1-inch-minus material, this machine will be able to turn out between 190 and 250 tons per hour.

When the last of the aggregate base course has been laid, the single-penetration asphalt treatment will be subcontracted. In all probability, an MC2 or MC3 asphalt will be used, and a final application of oil will be covered with a sand blotter coat. That will complete the bituminous surface which already exists.

The job was designed and is being supervised under the general direction of George Lang, state highway engineer, for the Arizona State Highway Department. C. B. Browning, deputy state highway engineer, is assisting with the work.

THE END

Engineer recruiting plan is started in New Jersey

Taking a cue from private industry —which has snapped up newly graduated engineers who show promise— the New Jersey State Highway Department last month began an intensive 26-week training course for eleven young engineers who had been graduated in June.

Under the recruiting program, carried out by the department's office of personnel, the eleven engineers will receive general training in bridge and road design and construction, traffic engineering, electrical operations, soil analysis, and maintenance. Performance and appraisal reports, together with periodic examinations, will determine the ability and aptitude of the trainees as they move from bureau to bureau.

No more than two men are being assigned to a particular operation at one time. On completion of training, the eleven graduate engineers will be given the title of junior engineer, highway. The starting salary for these trainees has been set at $4,020 annually, through the cooperation of the Department of Civil Service.

Youngmann is appointed Buffalo district engineer

The New York State district engineer for the six-county Rochester area, Elmer G. H. Youngmann, last month became district engineer at Buffalo, succeeding Charles Waters, who retired. The post of district engineer for the Rochester area has been temporarily filled by Bernard F. Perry, assistant district engineer, who will serve until Mr. Youngmann's successor is selected.

Mr. Youngmann joined the State Department of Public Works in 1914. After working for the State Public Service Commission on subway building in New York City prior to World War I, he returned to Buffalo, subsequently working up to the post of assistant district engineer.

Mr. Perry was in charge of bridge design and construction, and grade-crossing elimination for the Rochester district for eight years before becoming assistant district engineer last year.

Campello heads sales of Marion Power Shovel

Robert Campello has been appointed sales manager of the Marion Power Shovel Co., power shovel and crane manufacturer of Marion, Ohio. In his new post, Mr. Campello will be in charge of sales of all Marion machines sold through distributors in the United States and Canada.

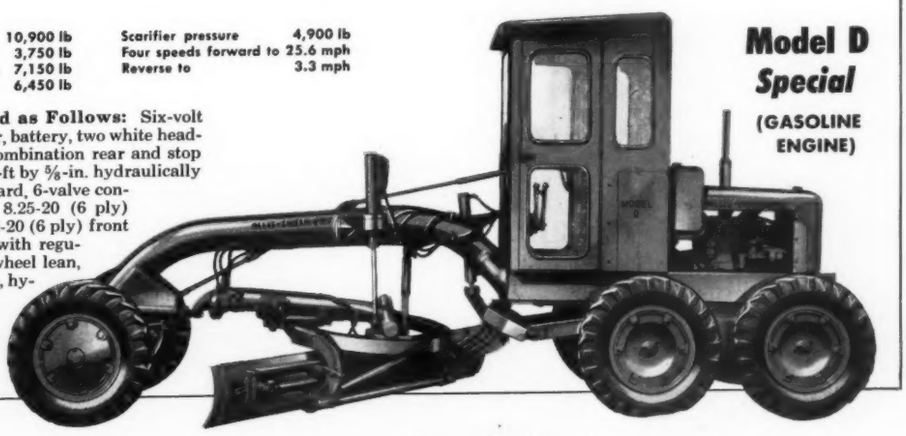
Walter Pierson, the new southeastern sales manager for the company, will make his headquarters at the new district office and warehouse building in Atlanta, Ga. He will be assisted by R. S. Rheay, divisional sales manager, and R. L. Patience, district sales representative.

The northeastern sales manager is Paul Fenwick, who will make his headquarters at the district office in New York City. B. F. Hansen, William Garrsion, and Edward R. Gee, all divisional sales managers for the office, will assist Mr. Fenwick.

A list of coming conventions appears on page 95 of this issue.

Model D Special (GASOLINE ENGINE)

Scarifier pressure 4,900 lb
Four speeds forward to 25.6 mph
Reverse to 3.3 mph



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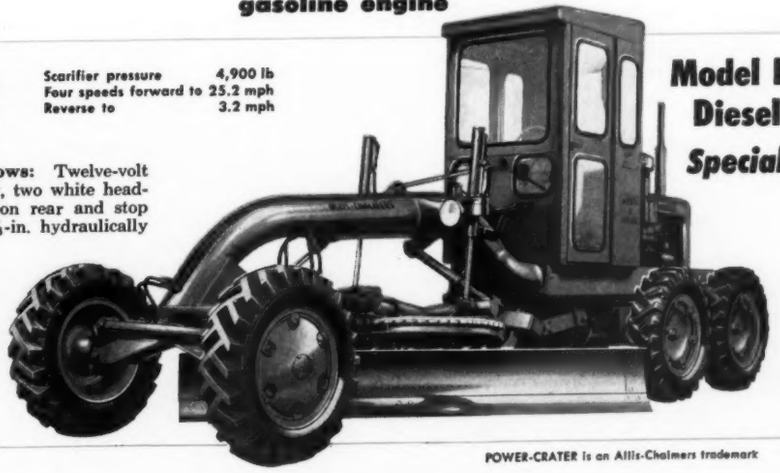
NOW AVAILABLE WITH YOUR CHOICE OF TWO OUTSTANDING ALLIS-CHALMERS ENGINES

50-hp POWER-CRATER gasoline engine

50-hp diesel engine with follow-through combustion

Model D Diesel Special

Scarifier pressure 4,900 lb
Four speeds forward to 25.2 mph
Reverse to 3.2 mph



POWER-CRATER is an Allis-Chalmers trademark

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Aggregate handlin

Conveyors, trucks, and transfer plant move 600,000 tons of aggregate 6 1/2 miles from rail siding to dam site

1. The full load is dumped in a few minutes into the extra-large track hopper, which is long enough so that all gates of the car can be opened and the material unloaded without moving the gondola. A Hewitt-Robins car shakeout speeds the process, removes all of the material, and eliminates the need for hand work.

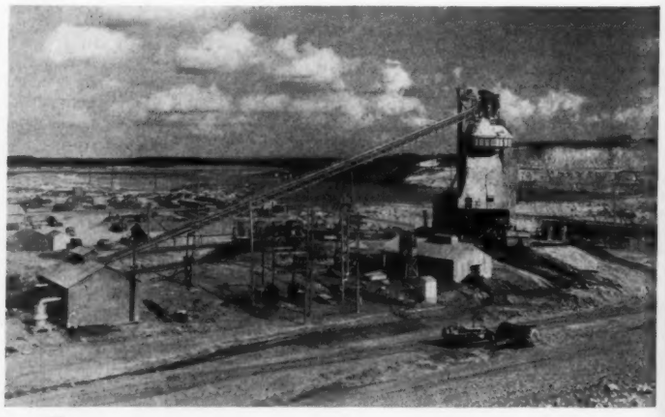
Transferring 600,000 tons of aggregate from railroad gondolas to dump trucks and hauling these materials 6½ miles to Gavins Point Dam is a substantial project in itself. This volume of aggregate, required for the more than 300,000 cubic yards of concrete in the dam structures, is being produced and delivered to the project by L. G. Everist, Inc., Sioux Falls, S. Dak. The job of unloading and trucking the materials to the dam site has been sublet to Harry Griffin, Moses Lake, S. Dak.

The coarse aggregate, consisting of crushed quartzite in four sizes, ranging from ¾-inch to 6-inch, is produced at quarries at Sioux Falls and Dell Rapids, S. Dak. Fine aggregate is a natural sand produced at Hawarden, Iowa. Arriving at a Yankton, S. Dak., rail siding, hopper-bottom gondolas of material are switched into position over the track hopper by a Hough Payloader tractor fitted with heavy steel push plates at both front and rear. A plant at the siding permits aggregate to be transferred from the gondolas to a fleet of ten Ford F8 and International R-190 dump trucks which haul to the dam.

2. A short 36-inch conveyor belt operating out of the bottom of the track hopper transfers the aggregate to the belt of a long inclined conveyor which leads to an elevated 70-ton single-compartment bin. The unloading plant, with a crew of only five or six men, is able to handle as many as 250 carloads of aggregate in a week.

3. Another International loads from the bin as the conveyor brings more material up from the cars. Twin air-operated gates at the bottom of the bin permit the 8-yard dump box of the truck to be loaded very quickly, without requiring that the truck be moved. A Westinghouse compressor supplies air for the gate operation and for vibrators.

4. At the job site, several sizes of aggregate are dumped from trucks to a steel hopper equipped with a Syntron vibrating feeder. A 400-foot-long Link-Belt shuttle conveyor then carries material to a Link-Belt stacker conveyor. This has a 30-inch belt suspended from a frame that can be raised to build a 45-foot-high stockpile.



5. A 30-inch Link-Belt conveyor 300 feet long operates inside an Armco 8-foot-diameter recovery tunnel to carry materials to the Conveyco 294-foot-long inclined conveyor (above) leading to the 350-cubic-yard bin of the Johnson plant. Manually operated Johnson gates in the tunnel roof control the flow, and lights indicate the size of aggregate needed. The End

nd powerhouse construction

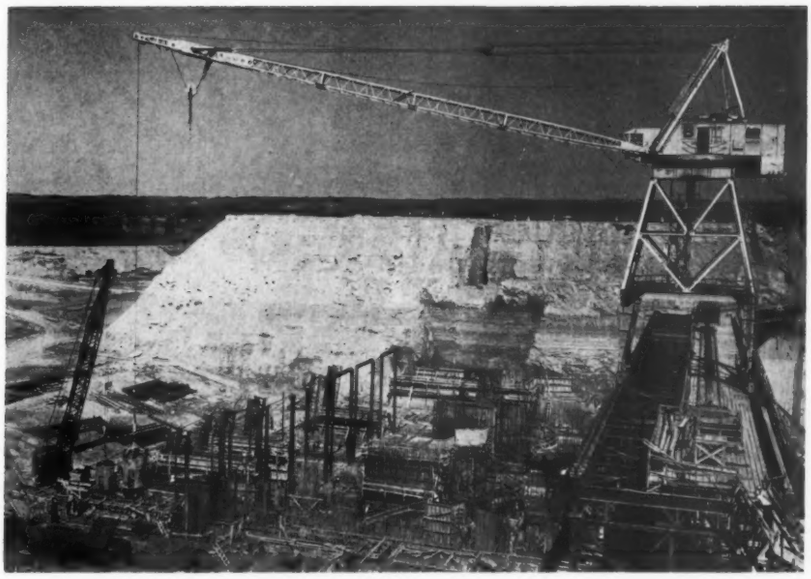
Gavins Point Dam

by RALPH MONSON, field editor

The world's largest "barn" protects winter concrete work at powerhouse

A companion article appears on page 44

C&E Staff Photos



An American R-20 revolver places substructure concrete with a Johnson 4-yard air-operated bucket before the enclosure was built. The crane at left assists with a section of the pour just out of reach of the big crane's 138-foot boom.

A dam closure, such as closure of the mighty Missouri River at Gavins Point Dam, scheduled for this summer, is a spectacular operation.

Equally dramatic, though less known, was the contractor's defiance of cold and snow through winter months to finish concreting operations in the powerhouse substructure so that the river could be diverted through the intakes. This is the work that made it possible for the closure to be made this year rather than during a period of low flow during the summer of 1956.

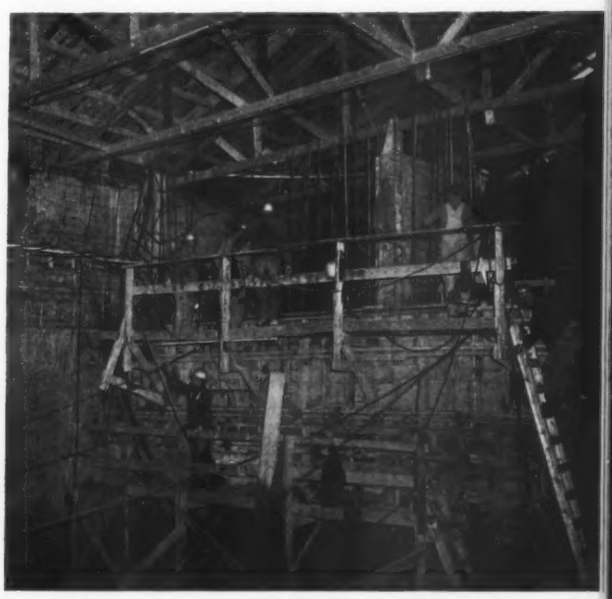
One of the main-stem dams being constructed under the Pick-Sloan plan, Gavins Point Dam is the farthest downstream in the series, being located on the Nebraska - South Dakota border about four miles upstream from Yankton, S. Dak. The U. S. Army Corps of Engineers, which planned the dam to re-regulate fluctuating discharges from Fort Randall Dam 75 miles upstream, also supervised construction through its Omaha district. By the time of closure, work on the $17,624,000 contract covering the earth embankment for the dam, powerhouse structure, and the complete spillway had virtually been completed by Western-Massman-Jones Companies, Yankton, a joint-venture firm composed of Western Contracting Corp., Sioux City, Iowa; Massman Construction Co., Kansas City, Mo.; and J. A. Jones Construction Co., Charlotte, N. C.

Enclosure is prefabricated

In this area, concrete-placing operations on most construction jobs are suspended for four or five months during the coldest part of the winter when temperatures frequently drop below zero and blizzards are common. But when cold weather moved in on the dam site, the contractor enclosed the entire powerhouse area in a huge L-shaped frame—dubbed the "world's largest barn"—which covered nearly 35,000 square feet of space. From an initial height of 56 feet, the enclosure grew with each lift of concrete until it was 96 feet above the invert of the intake structure. Although the entire initial enclosure was set in place in about four days, planning of the structure and prefabrication had been going on many weeks in advance.

Wall panels about 10 × 26 feet in section, prefabricated in the well

One of the roof panels in the structure is removed by an American R-20 revolver preparatory to a pour. Wall panels about 10 × 26 feet, of 1-inch lumber backed with 2 × 6 studs and covered with roofing felt, provide adequate protection in South Dakota's below-zero temperatures.



Inside the enclosure, workmen construct forms in the erection bay of the powerhouse. High-pressure steam distributed through 34 unit heaters provided heat inside the structure.

Rapid weathering of the chalk banks near the powerhouse make it necessary to remove loose rock as a safety measure. A crane lowers a hanging scaffold carrying two men who dislodge weathered material with air spades.

equipped carpenter shop, were built with 2×6 studs sheathed with 1-inch matched lumber and covered on the outside with roofing felt which was battened down. These panels were placed by an American R-20 Revolver mounted on a 60-foot gantry and operating from a 110-foot-high trestle. Side wall panels were tied into the concrete intake piers to provide stability.

Steel columns supporting the roof of the enclosure were embedded in the concrete of the structure. As successive lifts were added, columns were extended by additional sections welded into place. Steel beams between the columns supported prefabricated wood trusses, which in turn supported the roof panels. These, built of the same materials as the wall panels, were designed so that they could be easily removed by the crane to admit concrete buckets during pours.

The interior of the big enclosure was heated by high-pressure steam which was generated by three oil-fired boilers and distributed through 34 unit heaters rated at 260,000 Btu each. Since there were no windows in the enclosure, artificial illumination was provided in areas where forming, pouring, or other work was in progress. These work areas were lighted with 500-watt lamps in floodlighting fixtures; other areas were illuminated only enough to permit workmen to move around safely.

Central concrete plant

More than 310,000 cubic yards of concrete, produced in a big Johnson concrete plant, went into the powerhouse substructure and the spillway. Aggregates ware delivered to the 350-cubic-yard five-compartment bin at the top of the plant by a Conveyco 294-foot-long inclined conveyor. The five compartments stored four sizes of coarse aggregate, ranging from 6 inch down to ¾ inch, and sand.

Ash Grove cement from the mill at Louisville, Nebr., was shipped by rail to Crofton, Nebr., and transferred to two Gramm 75-barrel cement trailers with International R-190 trucks which hauled to the dam site. Two C. S. Johnson silos, one of 2,000 and one of 4,700-barrel capacity provided a total cement-storage capacity of 6,700 barrels. Two cement elevators 100 feet high carried the cement to the bin at the top of the plant.

Water for the mix as well as for other uses around the site was pumped from the river by a Deming vertical turbine pump suspended on an A-frame over the water. The electric-powered pump, rated at 1,000 gpm against a head of 50 feet, pumped through a 6-inch line to a 1,500-barrel settling tank. Alum added to the water in the settling tank improved precipitation of the suspended impurities, and solids which settled were removed when the tank was flushed from the bottom every other day.

Clear water was drawn off the top of the tank and pumped to a second 1,500-barrel storage tank. The big tanks were insulated against summer heat and winter cold by bales of straw piled around them. From the storage tank, water was distributed to the concrete plant and around the site by two high-pressure pumps—a Gardner-Denver used as a service pump and an Ingersoll-Rand as a standby unit.

Batches containing an average of 4 to 4.1 sacks of the Type II cement per cubic yard of concrete were weighed out into four Koehring 2-yard tilting mixers controlled by an automatic interlock device. Protex air-entraining agent was added to the mixing water to improve the resistance of the concrete to freezing and thawing. The plant had an average capacity of 160 cubic yards per hour and produced as

Check

PRICE PER POUND OF LIFT CAPACITY

Here is a sound way to measure the value of excavators and cranes. Compare machines on the basis of price per pound of lifting capacity. You'll very quickly learn which machine offers you the biggest production capacity per dollar of equipment investment.

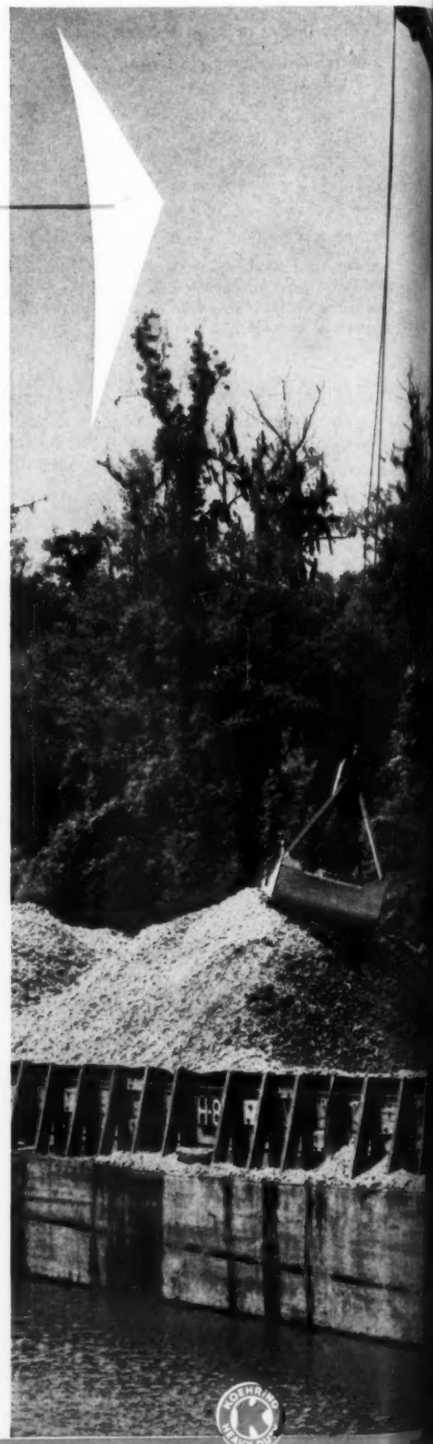
Remember — lift capacity is *work capacity*. Obviously, the machine with heaviest lift rating not only picks up larger crane loads. It also has more strength, speed and stability with every excavator attachment to handle bigger loads on a faster operating cycle.

Check the Koehring lift ratings shown below — then ask your Koehring distributor to give you the figures on price per pound of lift capacity.

compare for yourself:

KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load)		PRICE PER POUND OF LIFT CAP.*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

*Figures available on request—ask your Koehring distributor to see them.



much as 1,100 cubic yards for a single shift's pour.

Concrete hauled by rail

A standard-gage railroad track led from the concrete plant to the trestle which crossed the spillway. A big Colby revolving crane on a 30-foot gantry operated from this trestle to handle form panels and place concrete for the spillway structures. The railroad tracks were laid between the rails on which the crane operated, so that railroad traffic could pass back and forth under the crane without interfering with its operation.

At the far end of the spillway trestle, the railroad entered a narrow cut in the chalk island which separates the spillway area from the powerhouse. Emerging from the other side of this cut, the rails led out onto the high trestle which supported the big American R-20 Revolver which served the powerhouse construction area. Here again, the crane straddled the railroad.

Each of five diesel locomotives hauled one standard flatcar equipped to carry three Johnson 4-yard concrete buckets and having space on the car for an empty. Two of these locomotives were Brookville 14-ton machines, two were 10-ton Plymouths, and the fifth was a 16-ton Plymouth. Several passing tracks and spurs on the line permitted the rigs to shuttle back and forth from the concrete plant to the pours with a minimum of delay.

On small or remote pours, or when the big cranes were busy on other work, some of the concrete was hauled by a Mack truck pulling a Fruehauf low-bed trailer. This rig could carry either two of the 4-yard buckets or three 2-yard buckets. Some small pours were also made with three Chevrolet trucks, each of which carried one of the 2-yard buckets.

A Wiley 2-yard manually operated bucket, lowered through a roof opening, dumps concrete into powerhouse forms. Electric lights provide illumination inside the building during the round-the-clock operations. Pours were halted only during four extremely cold days.

Most of the concrete placing was done by the night shifts, and the greatest part of the forming and other preparatory work was carried on by the day crews. In this way, the two big revolving cranes were available for both operations. The American R-20 on its high gantry and trestle covered practically the entire powerhouse area with its 138-foot boom, placing most of the concrete in the powerhouse area with Johnson 4-yard air-operated buckets. Blaw-Knox and Wiley 2-yard buckets with manually-operated gates were used on some of the smaller pours. A Northwest Model 95-D crane helped with some of the pours along the upstream side of the powerhouse intake structure. These pours were either near or beyond the limits of the reach of the revolver crane.

Spillway pours were made by the Colby revolving crane on a 30-foot gantry, which worked on the trestle over the spillway. This crane had a 108-foot boom and a 25-foot jib which enabled it to reach about half of the spillway structure. Because of the large amount of concrete required in the weir, it actually placed about two-thirds the volume of concrete, assisted by a Manitowoc 3900 crane.

Consolidation of the concrete in mass pours was done by a Jackson 6-inch electric vibrator and other smaller machines. Handling the big vibrators was a two-man job. Other vibrators used included Viber and Mall electric and Chicago Pneumatic air-operated machines.

Heating concrete in winter

During the summer, when temperatures reached as high as 116 degrees, the contractor had to use special measures to keep the temperatures of large volumes of concrete from going too high. Aggregates were cooled with water sprays, and mixing water was stored in insulated tanks. Since the mass pours were not exceptionally

large, this was really much less of a problem than keeping the concrete warm in winter.

During the cold months, steam heat was supplied to the aggregates and mixing water. Four 12-inch steam mains were laid under the aggregate stockpile and a 2½-inch line in the recovery tunnel. A small amount of live steam was released into the aggregate bins and the mixing water the first winter, and dry heat was forced into the aggregate bins by a blower-type heater. But last year, steam pipes were used to avoid the erratic moisture content caused by introducing live steam. Concrete buckets were covered during the haul from the mixing plant to the pour. With these measures, it was possible to pour concrete all winter, except for four days when temperatures dropped to 18 degrees below zero.

The 14,000,000 pounds of reinforcing steel for reinforced-concrete construction at the dam was hauled to the site in 800 truckloads from the plant of the Sheffield Steel Corp., Kansas City, Mo. Structural steel for the spillway bridge was fabricated by Stupp Bros. Bridge & Iron Co., St. Louis, Mo. Tainter gates were supplied by Omaha Steel Works, Omaha, Nebr. Gate hoists came from Western Gear Works, Seattle, Wash., and the draft tube gates and guides were fabricated in Orange, Texas, by Consolidated Western Steel Division.

Personnel

The crew, which at times exceeded 850 workmen, was supervised for Western-Massman-Jones by project manager William Pappenheimer. His principal assistants were project engineer J. M. Strubert and field superintendent J. L. Fletcher. All of the earthwork in the contract was handled in the joint venture by Western Contracting Corp. Superintendent D. T. Jackson was in charge of earthwork operations for Western.

The project was constructed under supervision of the Fort Randall Area of the Omaha District, U. S. Army Corps of Engineers. G. O. Evans is area engineer, and Joseph C. Patterson, project engineer in direct charge of the work. They were assisted by R. H. Brown, chief of the administrative sections, and Ben M. Babb, chief of construction. Col. T. J. Hayes, III, is district engineer of the Omaha District. THE END

Detachable rock bits

■ Details on a line of detachable rock bits are given in a folder from Throwaway Bit Corp., 4200 N. W. Yeon Ave., Portland 10, Oregon. Throwaway bits feature an inexpensive and convenient method of attaching to easily prepared drill rods.

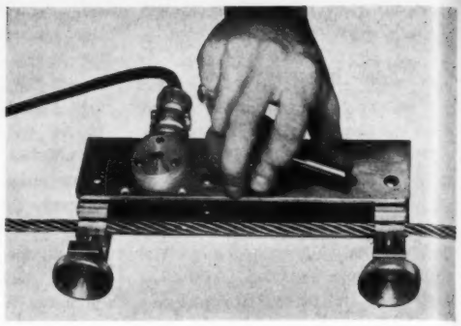
Sizes listed range from 1¼ to 1¾ inches in a ⅞-inch-socket series, and 1 $^{9}/_{16}$ to 2¼ inches in a 1-inch-socket series. These bits are made in both side-hole and center-hole types. Larger sizes are also made for wagon drills using 1¼-inch steel.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 521.

Instrument measures tension in wire rope

■ A new instrument that measures tension in wire rope electrically has been announced by Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa. The Baldwin SR-4 tensiometer is attached anywhere on a tensioned cable by screw clamps at each end of the instrument. Tension is measured by the force exerted on an adjustable pin that deflects the cable midway between the clamps. Force measurements are transmitted from resistance-wire strain gages in the tensiometer to a central indicator or recording instrument.

The instrument was developed primarily for checking and adjusting cable loads, especially when the load is distributed among several cables. In such use the principal advantage of the SR-4 tensiometer stems from its ability to centralize measurements by several tensiometers. These remain in place on all cables until the load is properly distributed.



The SR-4 tensiometer, developed by Baldwin-Lima-Hamilton Corp., is based on the electric principles of the SR-4 resistance-wire strain gage.

The new SR-4 tensiometer was designed for loads up to 5,000 pounds on cables up to ½ inch in diameter, but can be ordered for other sizes.

For further information write to the company, or use the Request Card at page 18. Circle No. 467.

"Four reasons why the F is the hottest thing in road equipment today"

IT'S MOST VERSATILE!

The Flex-Plane will do everything. It converts to its own trailer by the flick of a finger. It widens — hydraulically — to suit various slab contours without leaving the forms. Its extra width range enables it to take the place of two standard finishers. It takes and holds a crown easily and accurately. In fact, whatever your operations call for, you'll find the answers in the Flex-Plane.

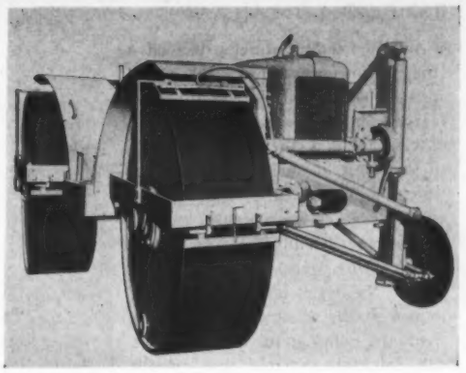
IT'S RUGGED— DEPENDABLE!

The Flex-Plane is sturdily constru ed to give years of trouble-f service. Although it will widen b yond the maximum of other finishers it f tures a "triple lap" frame that will per this extra widening without sacrificing s bility. Heavy duty, extra wide screeds a mounted outside the frame for better scre ing, ease of any on the job screed alteri and permitting easier "shoveling-in" in fr of screeds.

A pair of Flex-Plane Finishers at work on the eastern end of the Ohio Turnpike.

THE WORLD'S LARGEST MANUFACTURER OF CONCRE NIS

Dual-compression trench roller has adjustable compaction width



This new Blaw-Knox trench roller for road-widening work has two compression rolls, each delivering a pressure of 345 pounds per linear inch with water ballast. The position of the rolls can be changed to vary compaction width between 20 and 39 inches.

■ A dual-compression trench roller for road-widening jobs has been placed on the market by the Construction Equipment Div., Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa. The new Model DTR-552 trench roller is equipped with two heavy compression rolls 60 inches in diameter and 20 inches wide. Compression delivered per linear inch of roll face ranges from 250 pounds without water ballast to 345 pounds with water ballast for each roll.

The position of the rolls can be changed to set the compaction width of the roller anywhere between 20 and 39 inches. This adjustment can be made while the machine is in motion, thus permitting the operator to dual-roll where the widened strip is narrow and to roll up to 39 inches per pass where the strip is widened for curves. Rolling depth reaches up to 24 inches below the existing pavement.

The operator is seated between the two rolls, enabling him to see ahead regardless of the direction of movement and to observe the pavement edges as well as both compression rolls. In addition, reversed fan blades in the engine blow hot air and dust away from the operator.

Each compression roll can be steered independently through hydraulic controls, permitting the operator to work to the inside radius of a curve without reducing his speed. The compression rolls are synchronized with the two mated leveling wheels, mounted on 7:50×10 ten-ply pneumatic tires. Swivel-type tie-rods compensate for uneven trench-rolling conditions.

Two speeds, forward and reverse, are provided: a low of 1.62 mph and a high of 5.55 mph. The engine is a Continental F-226 with 50 brake horsepower at 1,800 revolutions and a piston displacement of 226 cubic inches. Electric starter, generator, governor, and battery are provided.

Over-all dimensions of the trench roller are: length, 14 feet; width, 8 feet; and height, 6 feet. Shipping weight is about 15,000 pounds.

For further information write to the company, or use the Request Card at page 18. Circle No. 426.

Compact air compressor

■ A 125-hp electric-driven air compressor has been added to the Ingersoll-Rand line of air-cooled two-stage Type 40 stationary compressors. Adaptable to either permanent or temporary work, the lightweight compressor is designed to be easily moved from job to job. The unit is rated at 80 to 125 psi.

New features are: single-core horizontal-flow intercooler, new shrouding, force-feed lubrication, full free-air unloading, and a new version of the Ingersoll-Rand channel valve. Either constant-speed control or dual control can be furnished.

Other Type 40 I-R compressors are available in sizes of 25, 40, 50, 75, and 100 horsepower.

For further information write to Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 408.

H. K. Porter Co. adds twelfth division

H. K. Porter Co., Inc., Pittsburgh, Pa., has purchased the Vulcan Crucible Steel Co., Aliquippa, Pa., a tool steel manufacturing firm founded in 1901.

James O. Flower, president of the firm, will be vice president and general manager of the division.

A new district sales representative for another of the H. K. Porter divisions is Robert M. Johnson. He will represent the Leschen Wire Rope Division in New England and in eastern New York State.

FLEX-PLANE Finisher

Two Flex-Plane Finishers at work on a section of the Ohio Turnpike south of Cleveland.

IT'S EXTRA FAST!

Husky enough for the toughest jobs the Flex-Plane has power to spare. A unique transmission converts this power to speed when moving back down the forms. Thus, e Flex-Plane can easily keep pace with the stest spread even when making two or ree passes. It has multiple speeds both for-rd and reverse, with selector on the con-ol panel. Contractors who have used the ex-Plane find they can actually make oney on repair jobs. It's that good!

IT DOES MUCH MORE!

Every part of the Flex-Plane has been thoroughly engineered and job tested on hundreds of miles of roadway — both single and double width. It's a proved piece of equipment that will give you a better finish, faster, and at less cost than any other machine of its kind. Look it over. Let us show you one in operation near you. Talk with the owner or operator and we feel sure your next finisher will be a Flex-Plane — the fastest selling finisher on the market.

NISHING MACHINES

THE FLEXIBLE ROAD JOINT MACHINE COMPANY
4600 THOMAS ROAD
WARREN, OHIO

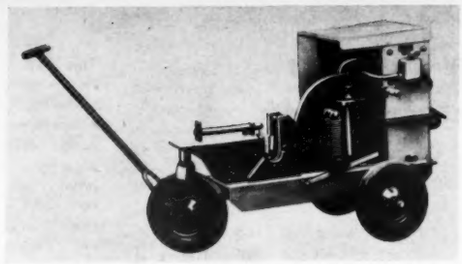
I am interested in getting faster, better, more economical finishing. Please send me literature on the FLEX-PLANE Detroit Special.

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____

Reinforcing-bar shears

■ An imported reinforcing-bar cutting machine designed to cut iron and steel in thicknesses up to 2 inches features a long-lasting cutter. Made of a special alloy, the cutter is shaped in the form of short square prisms which can be turned to expose a new cutting edge as wear occurs.

The Swedish-built Hallto bar shear is fitted with wheels and a drawbar so that the entire unit may be easily moved on the construction site. The hydraulic pump of the machine is of the continuous-screw type, which forces the oil forward smoothly without noise or vibration.



The Hallto reinforcing-bar cutting machine.

Other important features include both hand and foot controls, working pressures up to 150 tons, fully hydraulic operation with automatic return, and a capacity of 20 cuts per minute. Special jaws are available for cutting angle iron. The unit is powered by either an electric motor or a gasoline engine.

For further information write to Homestrand, Inc., 9 Addison St., Larchmont, N. Y., or use the Request Card at page 18. Circle No. 455.

Lift trucks now have torque-converter drive

■ A simplified torque-converter-type drive is now offered for the Hyster 3,000-pound-capacity UC-30 and the 4,000-pound-capacity YC-40 lift trucks.

The design of this torque-converter drive includes a clutch for precise speed regulation when combining the traveling and hoisting operation. Partial engaging of the clutch allows a reduction in traveling speed while retaining fast lifting speed. This factor enables operators to raise loads at maximum rate while maneuvering into load position. Unlike machines with "creep" controls, there is no delay between pressure on the clutch control and actuation of the clutch.

The drive assembly combines the lift-truck transmission and drive axle into one unit. Final internal gear reduction is 3.1 at the wheels. All gears and bearings operate in oil from a common supply continually maintained at proper working temperatures by rotation of the converter, which draws air through the drive and housing.

For further information write to Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg., or use the Request Card at page 18. Circle No. 502.

Bulletin shows uses of sectional steel scaffolds

■ A bulletin describing and illustrating the uses of sectional steel scaffolding by general contractors, subcontractors, and industry is now available from the Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, N. Y.

On-the-job photos show the concern's Trouble Saver scaffolding in use on masonry construction, concrete shoring, plastering, painting, stonesetting, building renovation and repairs, roofing, and industrial maintenance and repairs.

To obtain Bulletin PSS-34 write to the company, or use the Request Card at page 18. Circle No. 459.

Film on timber connectors

How timber connectors enable builders to save time, material, and labor is the subject of a new 16-mm sound and color film released by the Timber Engineering Co., the research affiliate of the National Lumber Manufacturers Association.

Entitled "Engineered Timber Construction", the film is semitechnical and is designed primarily for builders, architects, and engineers.

Initial distribution of "Engineered Timber Construction" is restricted to building, engineering, and architectural societies and to architectural and engineering colleges in continental United States. Bookings are available through Timber Engineering Co., 1319 18th St., N. W., Washington 6, D. C.

Adams TraveLoader
Speeds Loading Operations

For Contractors

Like many other contractors, Gray & Fear, Woodbury, New Jersey, finds several profitable applications for Adams TraveLoader. This contractor says, "We use our TraveLoader on a wide variety of loading operations—loading gravel out of banks for resurfacing operations; loading from stockpiles and for loading surplus trench material on sewer contracts that we have. We particularly like the heavy construction, the good all-around visibility and the high-speed loading ability of this machine" . . . Ask your local Adams dealer to give you a working demonstration of how the TraveLoader will cut loading time and costs—for you!

Here a road contractor uses an Adams TraveLoader for picking up surplus dirt on a road-widening job.

For Counties

The Adams TraveLoader owned by White County, Ark. is used to profitable advantage in reditching operations in the process of maintaining proper drainage on its system of 3,600 miles of roads. County Judge Floyd E. Bradberry, says "Our TraveLoader does an outstanding job of loading surplus ditch and shoulder material and also creek bed gravel. We have found this machine to be readily adaptable to any of our needs. We like its simplicity and ruggedness—it has any loader beat that I have ever seen" . . . See your local Adams dealer for an on-the-job demonstration of the high-speed, high performing TraveLoader.

This county-owned TraveLoader is loading gravel from stockpile for road resurfacing operations.

LeTourneau-WESTINGHOUSE Company • Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

ADAMS

Motor Graders TraveLoaders Pull-Type Graders

Iowa Mfg. Co's. 55 × 30-inch roller-bearing roller crusher handles up to 520 tons of material per hour.

High-capacity crusher for secondary work

■ A 55 × 30-inch roll crusher for use in secondary screening operations has been announced by Iowa Mfg. Co., Cedar Rapids, Iowa.

Because of its large-diameter rolls, the Model 5530 crusher can handle up to 520 tons of material hourly, depending on the size of the finished product desired and the characteristics of the rock. It produces finished stone in 5-inch maximum sizes and ¼-inch minimum sizes.

The crusher can be equipped with two smooth roll shells, two corrugated roll shells, or one of each type, depanding on operating requirements. The opening between the rolls can be quickly and easily adjusted by inserting or removing shims in a slot atop the frame.

Safety shear plates protect the crusher against tramp iron or material that cannot be crushed, and Timken tapered roller bearings provide maximum wear and economical operation. Timing gears of chrome Molybdenum steel transmit power smoothly from the stationary to the floating roll.

For further information write to the company, or use the Request Card at page 18. Circle No. 498.

Worthington appointments

Hellmuth Walter, whose gas turbine and snorkel marked the biggest improvements in submarine design since World War I, has been made director of research for the Worthington Corp., Harrison, N. J. Robert S. Sherwood has been named as assistant director.

William J. Davies has been appointed district manager of the Cleveland, Ohio, office succeeding Robert ert J. Laidlaw, who has retired.

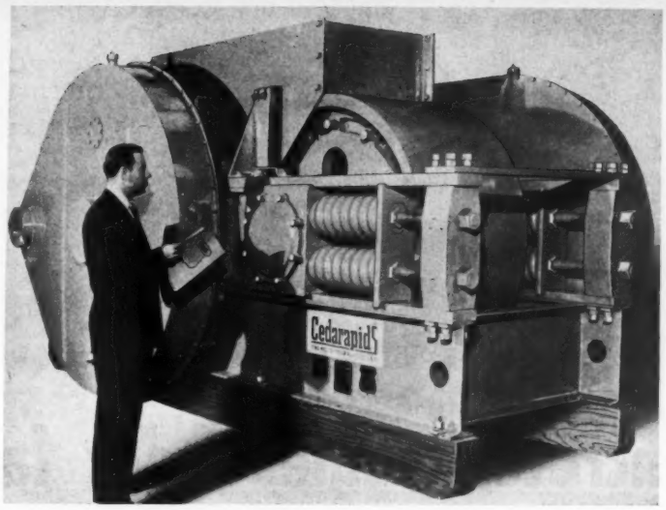
With the company since 1937, Mr. Davies has served as application and sales engineer in the Buffalo, N. Y., district office and as sales engineer in the Cleveland office. He is a member of the Registered Professional Engineers in Ohio and of the National Society of Professional Engineers.

Ohio expands program for weed control

The Ohio Department of Highways —one of the pioneers in the spraying technique for control of weeds along the roadside—has expanded its spraying operations to cover 8,750 miles of road this year.

Tractor-mounted 1,000-gallon units, which travel about 10 mph and use low-pressure nozzles, are doing the spraying job three times a year.

The spraying, done on days when the wind cannot catch the spray and carry it over flowers, shrubs, and trees, is designed to eliminate weeds growing along right-of-ways, to do away with the need for costly hand mowing, to clear and maintain drainage structures, and to open and maintain adequate sight distances.



Up-to-date New Jersey road map is available

A new road map of New Jersey—the first issued by the New Jersey State Highway Department since 1946—is now available free of charge. Published in the form of a booklet, the map reportedly is the most detailed encyclopedia of New Jersey roads ever compiled and printed.

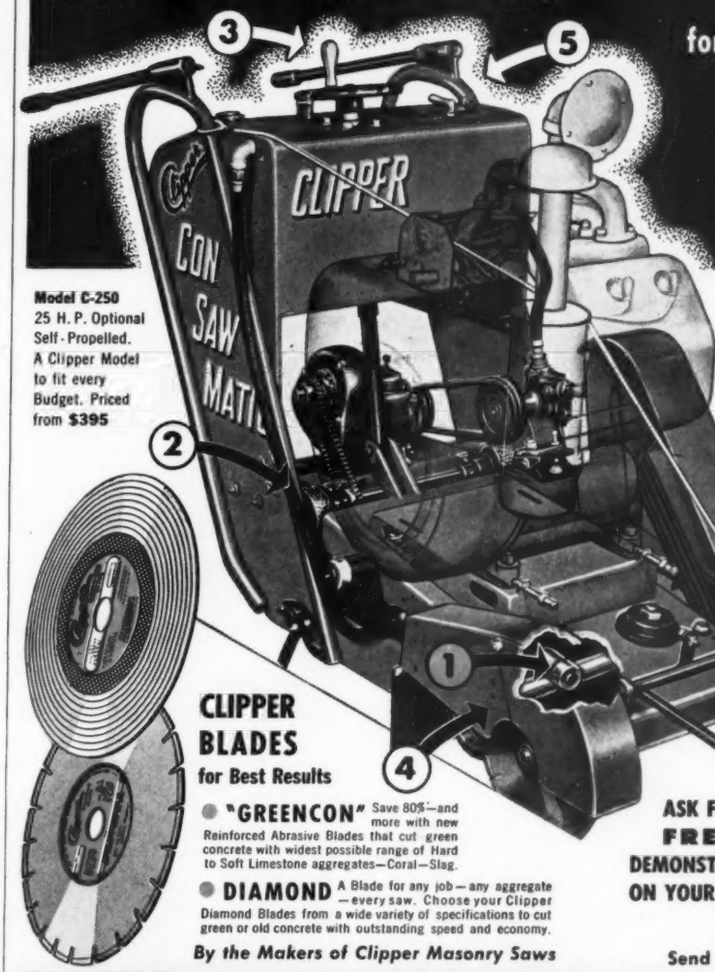
About 15,000 miles of state, county, and municipal roads are shown on the map, which also includes route markings and identification of railroads, airports, and other facilities.

A total of 500,000 maps was prepared for distribution. A copy of the map may be obtained by writing State Highway Map, Box 796, Newark, N. J.

NOW—See For Yourself
WHY You Cut More Concrete With
Clipper CONCRETE SAWS
DEMAND THESE FEATURES for Lowest Cutting Costs

Look Inside—Behind the Engine for Famous Clipper Quality!

1. 4 Wheels with 3-Point No-Bind Blade Suspension
2. Self-Propelled with Abrasive-Coated Drive Wheels
3. Positive Screw Feed
4. Patented Water Application
5. Dashboard Controls



Model C-250 25 H. P. Optional Self-Propelled. A Clipper Model to fit every Budget. Priced from **$395**

ONLY with Clipper do you get ALL these features in combination with Positive Screw Feed—an absolute MUST when cutting with "GreenCon" Abrasive Blades in green concrete.

Right from the dashboard, Clipper's Positive Screw Feed lets you compensate instantly and easily for the diminishing diameters of abrasive blades—the ONLY proven method of maintaining constant depth of cut. And Clipper's "Self-Propelled pace never tires—cuts faster all day with less operator effort—cuts smoother for longer blade life.

OPTIONAL EQUIPMENT includes: Self-Propelling Unit; Water Pump; Self-Starter—with battery and generator

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● **"GREENCON"** Save 80%—and more with new Reinforced Abrasive Blades that cut green concrete with widest possible range of Hard to Soft Limestone aggregates—Coral—Slag.

● **DIAMOND** A Blade for any job—any aggregate—every saw. Choose your Clipper Diamond Blades from a wide variety of specifications to cut green or old concrete with outstanding speed and economy.

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by ANTHONY N. MAVROUDIS,
field editor

One of the transit-mix trucks supplying concrete to the buggies heads toward the batch plant located just off the bridge at the Nyack approach.
C&E Staff Photos

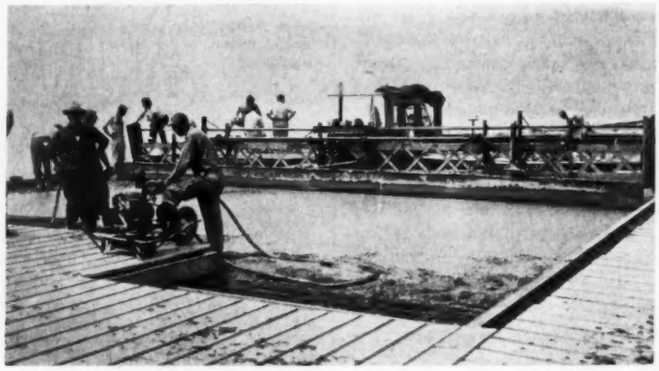
Concrete buggies work fast and steadily on bridge paving

Gasoline-driven units ride on 5-day-old pavemen expansion joints permit continuous concrete placi

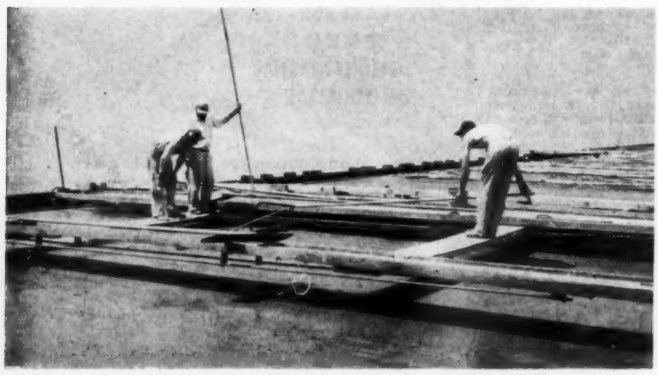
Concrete delivered to a double-drum hopper on the bridge by a Jaeger 5½-cubic-yard transit-mix truck is loaded into two Whiteman Power Buggies.

Buggies speed the short distance to the forms over wooden runways. The maximum haul length is kept at 1,500 feet.

A Whiteman Power Buggy dumps its ½-yard load of concrete. Buggies shuttled between forms and the concrete supply at 7 to 10 mph.



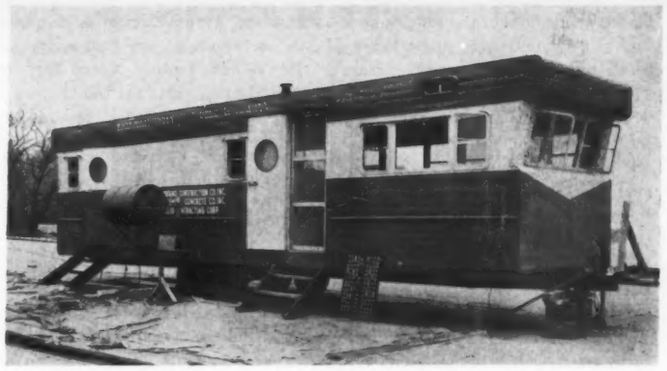
A Heltzel Flex-Plane makes a second pass over deck concrete as a Mall vibrator consolidates the mix. Two Heltzel rigs were used, one on each roadway.



Working from a manually operated finisher's platform, men with hand lutes smooth the concrete surface after longitudinal floating is done.

Hand-finishing operations complete a section of the 10-foot-wide mall separating the two roadways. In the background, the bridge curves toward Nyack.

Operations of the joint-venture paving firms are conducted from this Contractors Trailer Co. field office, located on the bridge.



Paving on the Tappan Zee bridge which will carry the New York Thruway over the Hudson River between Nyack and Tarrytown, N. Y., is moving along at a fast clip, with gasoline-driven Whiteman Power Buggies placing the 32,400 cubic yards of concrete for the two 3-lane roadways.

The 3-mile-long structure, being paved by the joint-venture firms of Garofano Construction Co., Inc., Mt. Vernon, N. Y.; West Shore Concrete Co., Inc., Suffern, N. Y.; and Euclid Contracting Corp., New York City, is being built in an S-shape to eliminate expensive relocation problems which would have arisen if the span had been built straight across the river. A total of 16 Power Buggies are being used on the paving, and each ½-cubic-yard buggy is capable of traveling from 7 to 10 mph over 5-day-old concrete. Batch trucks must wait 21 days before using the pavement.

Colonial Sand & Stone Co., Inc., New York City, is supplying all the concrete on this $4 million paving contract from its batch plant on the Nyack abutment. Concrete is delivered by Jaeger 5½-yard batch trucks to a double-drum hopper on the bridge. The buggies obtain their loads at this hopper, ride over the pavement and along boardwalks laid over the center line of the bridge, and unload in front of a Heltzel Flex-Plane spreader-finisher.

After reaching the maximum efficient haul length of 1,500 feet on one roadway, the buggies start hauling concrete for the other roadway. Two Heltzel Flex-Plane machines work on the concrete; one remaining idle while the other works on one roadway. This process is reversed whenever the maximum haul distance of the Power Buggies is reached.

Concrete placing

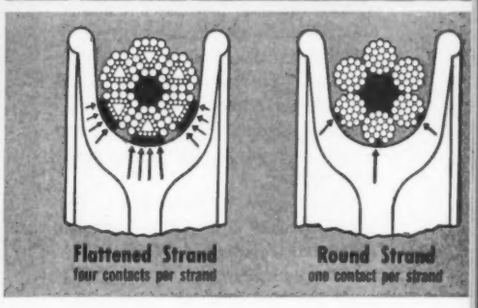
The Heltzel spreaders make two passes over the freshly poured concrete to assure uniformity throughout the roadway cross section, while Mall vibrators consolidate the concrete around the reinforcing steel. Hand-float finishing is done by a man standing on a rear platform of the spreader and by another man on a platform which is moved manually along the rails of the spreader. While longitudinal floating is being done, the spreader does not move. It starts working again as soon as the finishers smooth out the concrete surface with a hand lute. A burlap drag, applied by hand, completes the paving.

Concrete is then water-cured for seven days and completely covered with burlap. Water for the curing process is obtained from Nyack and metered. River water is acceptable under the specifications, but it was felt that mechanical failure of any pumping apparatus would cause unnecessary delays, while the job is assured a continuous supply of metered water.

From three to six bays—each containing 40 cubic yards of concrete—are placed in an 8-hour day. Reinforcing steel in the 6¾-inch-thick pavement consists of ⅝-inch rounds placed on 6-inch centers, top and bottom. About 7,820,000 pounds of reinforcing will go into the 15,620-foot structure.

Plywood forms, ¾ inch thick, are

(*Concluded on next page*)



How to handle the tough jobs with Hercules Flattened Strand wire rope

When you think you need a super-rope, check Hercules Flattened Strand. This is the wire rope that packs in 10% more steel than round strand rope, making it 10% stronger and safer. It wears longer and more evenly—reduces sheave wear, too.

The 10% extra strength over round strand rope is sometimes the difference between the possible and the impossible. Hercules Flattened Strand frequently does the tough jobs which would otherwise require larger size rope—and without the bother and expense of changing sheaves and drums. The extra strength is useful, too, when shock loading is involved. Saves rope and money.

If you think that Hercules Flattened Strand wire rope may solve a problem, talk it over first with your Leschen man. He can be reached through your nearby Leschen distributor. His advice is based on the best possible authority—Leschen's long experience and engineering research—the longest in the industry. And with Leschen wire rope you are assured of higher-than-rated quality and longer-than-expected service.

If you can use Hercules Flattened Strand rope you'll be money ahead. See about it soon.

LESCHEN
HERCULES *Red-Strand*® WIRE ROPE

Depend on Leschen's higher-than-rated quality for longer-than-expected service.

LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri

HKP

placed at the level of the top flange of the girders and are supported by 2×4's spaced 3 feet between girders. The 2×4's are supported by 2×6's which run along and are hung from the top flange of the girders. Forms are oiled when they are built, and again just before concrete is placed, to assure separation. After 10 days they are removed from beneath the bridge by men on barge-mounted scaffolding. As forms are removed, they are passed up and over each side of the bridge and moved forward to where they will be needed next.

Before concrete placing, a 6-inch-diameter spiral is welded to the top flange of the girder. This will make the concrete roadway act as an integral part of the steel superstructure of the bridge.

Along the straight section of the bridge, the roadway has a slope of 3/16 inch per foot to allow water to run off beneath the 3-foot 6-inch sidewalks. Along the curved portions of the bridge, the runoff will occur at the median and the inside edge of the roadway.

The concrete mall separating the roadways is 10 feet wide and 3 inches high, and has a "singing curb" on both sides. Tires riding on the curb set up a buzzing sound which warns the driver that he is too close to the mall. The sound will also rouse sleepy motorists, preventing them from driving across the mall and into oncoming traffic.

Unique expansion joints

Supporting the ¾-inch sponge-rubber filler and the copper waterstop without halting pouring operations every 50 feet—the spacing of the expansion joints—presented a unique problem. This the contractor solved by sawing 5-inch-square concrete conduits diagonally, from corner to corner, to form two right angles from each conduit.

Two angles, ¾ inch apart and back to back, are placed between girder flanges on the plywood forms. The copper waterstop is then inserted into, and supported by, the upright legs of the angles. The waterstop, in turn, provides the sponge-rubber filler with the necessary support.

Just before the paving train reaches the expansion joint, a ¾-inch copper cap is placed over the filler. The concrete is then poured and the spreader passes over the joint. Before the concrete hardens, the cap is removed from the ¾-inch-wide expansion joint. The waterstop is designed so that the top of the rubber filler is 1 inch below the roadway surface. An asphalt filler seals the expansion joint.

These are the only joints on the bridge. After placing a few hundred feet of roadway, the consulting engineers for the bridge project, Madigan-Hyland, Long Island City, New York, decided that longitudinal and transverse joints were not required, because of the heavy reinforcing used in the roadway slab.

Personnel

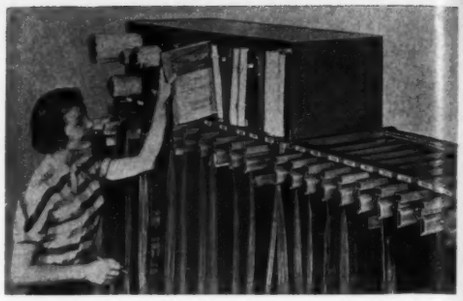
Charles Spero is the superintendent in charge of paving from the Nyack end and Frank Zuzzolo is in charge of operations at the Tarrytown side for the joint venture. Joseph J. Novellino, field engineer for the venture, is largely responsible for devising the expansion joint expedient.

THE END

Shelf for blueprint rack

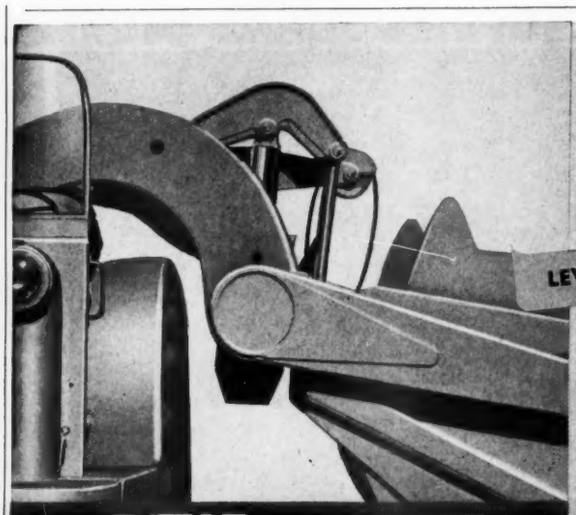
■ A new accessory shelf for specifications and rolled drawings is available from Momar Industries, 4323 W. 32nd St., Chicago 23, Ill. This shelf has been specifically designed as an adjunct to the Glider blueprint rack.

The new accessory fits directly on top of a Glider unit. It is 49 inches long, 13 inches high, and 17 inches deep.



A shelf for blueprints and specifications is now available as an accessory for the Momar blueprint rack.

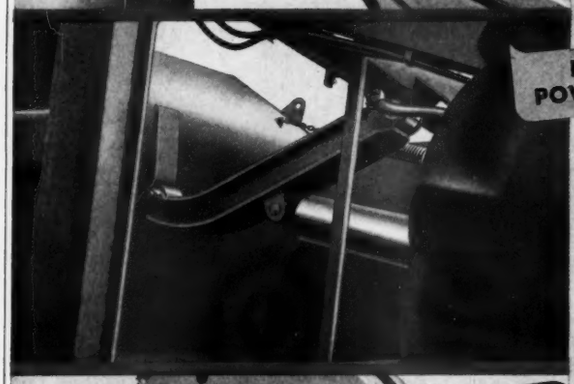
For further information write to the company, or use the Request Card at page 18. Circle No. 469.



Here's the Ne

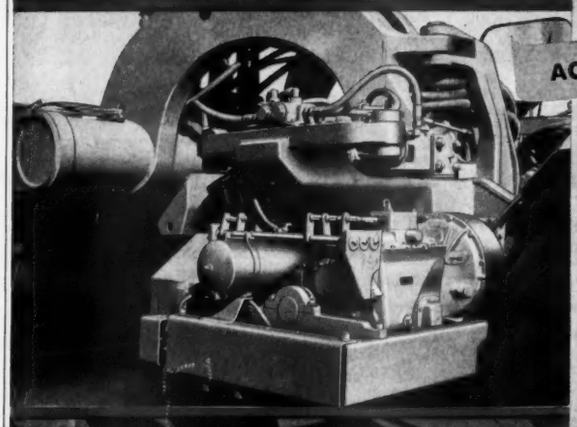
LEVER ACTION

Lever action, an exclusive Euclid feat does away with cable headaches for good . . . 12 ft. of cable used for the apron lift. All scra operations, bowl, apron and ejector, are actua by levers with independent hydraulic control . . . they fast and positive . . . not interconnected in any w All four of the hydraulic jacks are interchangea . . . one spare fits anywhere!



ROLL-OUT POWER EJECTOR

Roll-out power ejector is independently controlle dumps capacity loads, even wet, sticky material, and clean. Maximum power is available at star the dumping operation when it is needed most. C and roller action speeds up ejector action near the e of the dumping operation. High apron lift per fast, free ejection of big loads.

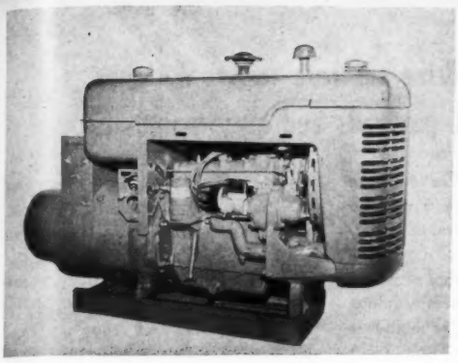


ACCESSIBILITY

Accessibility of major components — engine, d transmission and drive axles—is a time saving, cutting feature of the S-7 design. Repairs or repla ment do not require a major disassembly job. Remo of components takes about half the time required other small scrapers. Easy servicing and maintena keeps down time to a minimum—means more p loads per hour.

FOUR SECTION CUTTING BLADE

A four section cutting blade provides most effi loading in any material. Each section is reversi and interchangeable to give longer life and pe the straight or drop center blade arrangement suited for job requirements. A new cutting edge any blade arrangement can be obtained by s reversing or interchanging the sections.



Though 25 per cent smaller than previous Universal power plants, this new unit has a capacity of 5,500 to 6,000 watts.

Bantam-size power plant has large capacity

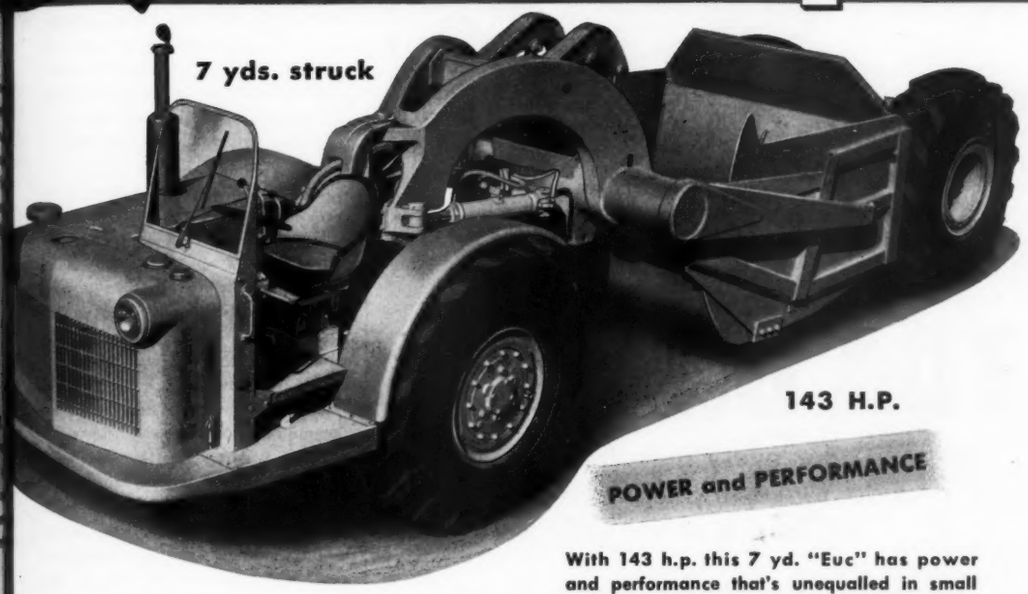
■ High capacity and small size are features of the new water-cooled electric plant manufactured by Universal Motor Co., 534 Universal Drive, Oshkosh, Wis. Available in all ac voltages, the plant has a capacity of 5,500 watts for continuous service and 6,000 watts for intermittent service, yet is 25 per cent smaller than older models made by the company.

The unit, powered by a four-cylinder four-cycle L-head engine which operates at 1,800 rpm, is self-contained, permitting it to be installed anywhere. Its heavy-duty crankshaft is counterweighted and precision-balanced for smooth service. The unit includes a centrifugal-type governor, a high-tension magneto ignition system, and a mounted fuel tank.

Five types of control are available: manual starting, electric starting, remote control, fully automatic control, and emergency automatic control. Operating under emergency automatic control, the plant starts automatically when normal power fails and automatically shuts itself off when power is restored.

For further information write to the company, or use the Request Card at page 18. Circle No. 489.

S-7 "Euc" Scraper



POWER and PERFORMANCE

With 143 h.p. this 7 yd. "Euc" has power and performance that's unequalled in small scrapers. . . 20 h.p. for every yard of capacity . . . 18.00 x 25 tires . . . and a top speed of 25 m.p.h. with full payload.

"Euc" S-7 is the newest addition to Euclid's Scraper —fastest growing line in the industry because of mer acceptance and preference. It incorporates of the features that have made larger Euclid pers tops in production and efficiency . . . and has ter accessibility than any previous "overhung" er on the market.

ilt to Euclid's standards of rugged construction for service life, the S-7 is engineered throughout for accessibility of all major components, for fast ng and travel, and for ease of operation. The power train—engine, clutch, transmission, plane-drive axle, etc.—is easy to get at for servicing, r or replacement. This is a mighty important cost g feature in a single axle prime mover.

fore you buy your next small scraper, check the making features of the S-7. Your Euclid dealer show you how this new "Euc" can get more done at lower cost than any other scraper of arable size.

MANEUVERABILITY

Maneuverability—so important for close quarter work—is excellent with the S-7. Full power steering and hitch design of the two-wheel tractor provides a 29 ft. non-stop turning radius. The 18.00 x 25 or 21.00 x 25 (optional) tires have large rolling radius for good traction and flotation.

UCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

Lift-truck attachment handles cement roof tile

■ A full-circle rotating hydraulic clamp designed as an attachment for standard Yale industrial lift trucks makes the handling of cement roof tile a more efficient procedure than it has been heretofore.

When placed on a standard 6,000-pound-capacity lift truck, this clamp can pick up a 3,500-pound load of cement tile or similar material at a 24-inch load center between its fixed forks and hydraulically operated clamp blades.

It can rotate the tiles through a 360-degree circle at any point in the vertical travel of the forks to suit storage or loading requirements.

For further information write to Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa., or use the Request Card at page 18. Circle No. 500.

Detector traps vehicles exceeding height limit

It's getting harder and harder to fool turnpike and parkway personnel about tolls, vehicle sizes, and vehicle weights. One of the newest automatic devices now in use on the Pennsylvania Turnpike is the height detector developed in the engineering laboratories of Taller & Cooper, Inc., a Brooklyn, N. Y. firm specializing in toll equipment.

The device, placed at a specified height at the Philadelphia interchange, throws a beam of light across the toll plaza at the height limit. Anything projecting above that level breaks the beam, causing an alarm bell to ring and a red indicator light to flash. The bell sounds only briefly, but the flashing signal continues until it is reset.

L. B. Foster Co. opens new Southeast office

To better serve the southeastern part of the country, the L. B. Foster Co., has opened an office in Atlanta, Ga. Stocks of steel sheet piling, steel pipe, and H-bearing piles will be available from the new facility at 805 Peachtree St. N. E., Atlanta.

Paul L. Duke will head the new office with Harold Ford to assist.

With its engine cantilevered, the new Oshkosh 50-50 concrete carrier has the benefit of equal weight distribution between axles to make big legal loads possible. Four-wheel-drive traction and easy access for maintenance are other features. ►

Four-wheel-drive concrete carrier designed for big legal payloads and easy maintenance

■ A new four-wheel drive concrete carrier, designed to carry a payload of 18,000 pounds on each axle, is now being manufactured by Oshkosh Motor Truck, Inc., 2300 Oregon St., Oshkosh, Wis. The unit features a unique design in which the entire engine is cantilevered forward of the front wheels.

This feature not only permits convenient service access to the carrier's Continental 141-hp engine, but also exposes the power steering unit and the horizontally-mounted differential units so that they may be serviced without removing the mixer from the chassis. Oshkosh standard parts are used throughout.

The Oshkosh 50-50 ready-mix concrete carrier hauls up to 5 cubic yards legally—depending on the mixer selected—including sufficient water for ready-mix concrete operation. The four-wheel-drive feature provides traction for spotting loads where they are wanted without building temporary roads. It also permits operation under adverse weather conditions that would ordinarily prevent the delivery of ready-mix concrete.

The front axle of the carrier is a double-reduction full-floating axle with alloy-steel heat-treated shafts. The 14:00×20 18-ply single front tires are reported to provide practically the same flotation as the four 10:00×20, 12-ply tires do on the rear. The rear axle is a single-reduction full-floating hypoid axle.

Because the unit's two driving axles have 20 per cent fewer parts than one conventional tandem unit, maintenance costs should be considerably lower than usual. The concrete carrier has a 144-inch wheelbase and is equipped with Vickers power steering which acts directly, with only one drag link. This feature permits the unit to make more payload trips per day, and also provides a shorter turning radius and permits easier load spotting than do tandem units.

Considerable attention has been given to driver comfort with equipment including the Bostrom driver's seat and front-mounted shock absorbers. All-round visibility, tinted safety-plate windshield, rear corner windows, and a cab heater are features.

Oshkosh trucks feature efficient all-wheel traction, made possible by a specially-designed automatic-locking center differential which compensates for the difference in travel between the front and rear axles and prevents tire scuffing. On the Oshkosh 50-50, the driver need not be concerned with manual locking and unlocking of the front axle.

For further information write to the company, or use the Request Card at page 18. Circle No. 431.

IF IT MOVES
WE CAN STOP IT!

TDA BRAKES

...for every industrial or automotive application where braking is required!

FSH...Floating Shoe Hydraulic Brake
Designed for close control with heavy loads

The FSH Brake presents some remarkable new advantages to manufacturers who need a better, longer lasting Hydraulic Brake. The features of the FSH were developed after years of field work and laboratory study. These advantages can be a road to new economy and better control for *your* equipment.

FSH Brake shoes operate with a floating action. This eliminates the danger of liner loads concentrating at one point . . . permits the shoe to follow the drum. The result of this even load distribution is a highly dependable, controllable brake—*in either direction* of travel. This is especially important when stacking heavy loads at high levels and maneuvering at close quarters.

For Additional Information . . . contact the Timken Brake Division. Complete details on the FSH Brake are available. And, a staff of experienced engineers can assist you with any brake problem you encounter.

Mechanical Parking Brake Hook-up
A separate parking brake is no longer necessary with FSH. If specified, the FSH Brake can be furnished with a mechanical parking brake linkage that functions independently of the hydraulic system.

Long Life Lining
Brake lining is bonded to the shoe to give maximum lining area with no lining waste.

Positive Automatic Adjustment
One application of the foot pedal sets the automatic adjustment. No further adjustment of the brake is required during the full life of the brake lining.

Positive Contact Drum Seal
For applications where a sealed brake is required, the FSH is designed to incorporate a seal between the brake backing plate and brake drum.

TIMKEN Detroit BRAKES
TIMKEN-DETROIT BRAKE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
AUBURN, INDIANA
Accepted A.D.A. Standard
TRADE MARK REGISTERED

Cleveland Trencher news

In a series of personnel changes, the Cleveland Trencher Co., Cleveland, Ohio, has promoted E. B. Volman to the post of vice president in charge of manufacturing and has appointed Clifford P. Morgan sales manager and David L. Raymond chief engineer. Mr. Volman, who has served the company as works manager for the past five years, has also been elected to the board of directors.

The Champion Tak-A-Bout masonry saw.

Portable masonry saw

■ A masonry saw, built with a tubular steel and aluminum mounting so that one man can move it about the job, has been announced by Champion Mfg. Co., 2028 Washington Ave., St. Louis 3, Mo. The saw rides on retractable wheels which are available as an accessory.

The Tak-A-Bout portable masonry saw is available in wet or dry-cutting specifications. It features Champion's 110 to 220-volt selector switch, which allows the use of the saw on any job where power is available without costly and time-consuming rewiring of the motor.

For further information write to the company, or use the Request Card at page 18. Circle No. 461.

Aluminum gear-case housing in new winches

■ New 12,000 and 20,000-pound Gar Wood winches feature a fully-enclosed back-draft clutch, an aluminum gear-case housing, shrouded drum flanges, and a built-in rope clamp. The new winches are made in standard and low-mount models.

The aluminum gear-case housing provides lighter weight and faster heat dissipation. All moving parts run in oil, including the special back-draft clutch.

Both of the new winches feature the Gar Wood automatic self-energizing safety brake, which automatically holds a full load up to specified rating. The 12,000-pound winch holds 960 feet of ⅜-inch rope, 603 feet of ½-inch rope, and 343 feet of ⅝-inch rope. With a 2-inch drum shaft, the winch has a worm-gear ratio of 23 to 1. Input is 240 rpm and worm torque is rated at 2,610 pound-inches. Torque of the brake is 258 pound-inches.

By utilizing a 9/16-inch rope wound to seven layers, the drum of the 20,000-pound winch holds 510 feet of rope. For a ⅝-inch rope wound to six layers, drum capacity is 383 feet. When a ¾-inch rope is used, wound to five layers, drum capacity is 268 feet. Drum-shaft diameter of the winch is 2 7/16 inches, and worm-gear ratio is 29 to 1. With an input of 257 rpm, worm torque is 4,120 pound-inches, and brake torque is 406 pound-inches.

For further information write to Gar Wood Industries, Inc., Wayne, Mich., or use the Request Card at page 18. Circle No. 487.

Why earthmovers adopted torque-converter drive

■ The history of earthmoving progress, particularly as it has been influenced by the torque converter, is reviewed in the latest issue of *Production Road* magazine. The publication is issued periodically by Twin Disc Clutch Co., Racine, Wis., manufacturer of friction and fluid drives for powered industrial equipment.

In this issue, the house organ tells how Allis-Chalmers, Caterpillar, and International have brought the efficiency of the torque-converter drive into use in their equipment for speedy work and more profitable daily output.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 483.

DAMAGE to underground structures, pipes, and cables by power trenching and excavating machines need not be considered an unavoidable risk. The Wilkinson line locator, compact and easy to operate, will find buried lines and indicate their true depth. Such precautions save repair costs and lost time, and keep insurance rates down. For further information write to Wilkinson Products Co., 3987 Chevy Chase Drive, Pasadena 3, Calif., or use the Request Card at page 18. Circle No. 552.

POWER PACKED BY HUBER-WARCO for TOUGH JOBS

Huber-Warco Motor Graders handle all jobs efficiently and economically, with a minimum of costly "down-time" for blade adjustment on the job. The real tough jobs are a snap for the Huber-Warco Motor Graders.

Huber-Warco 4D Series Motor Graders range from 75 to 123 Horsepower. The 5D-190, with torque converter and power-shift transmission, develops 195 H.P.

CHECK THESE HUBER-WARCO FEATURES

- Completely cab-controlled blade movement, 90° either side—no manual adjustments.
- Mechanical steering with hydraulic booster.
- High front and rear axle clearance.
- Retractable scarifier permits 360° blade rotation for back-up pass.
- Easy to reach controls.
- Wheels and tires are completely interchangeable.

For Complete Details — See Your Huber-Warco Distributor

HUBER WARCO

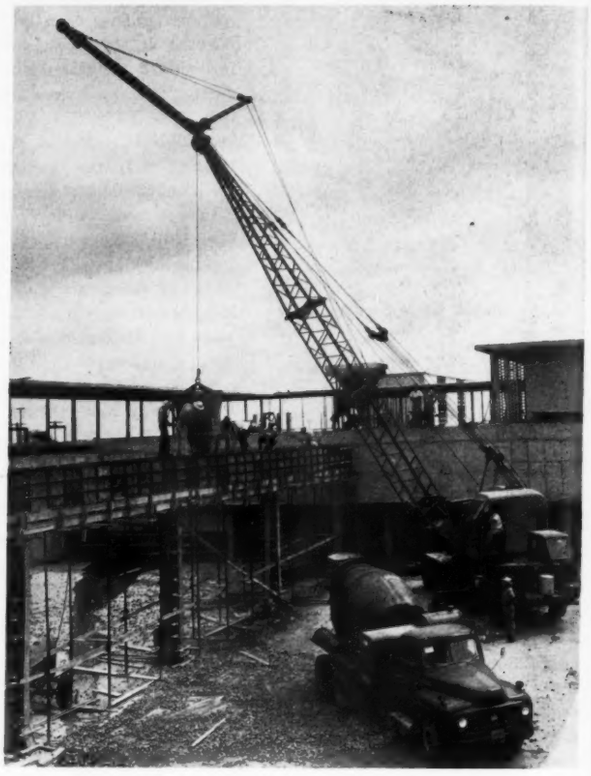
HUBER-WARCO COMPANY
MARION, OHIO, U. S. A.
Road Machinery
CABLE ADDRESS: HUBARCO

ROAD ROLLERS • MOTOR GRADERS • MAINTAINERS • GRINDERS

Preparing forms for the concrete roof of the clear well, a workman places Uni-Form 2 × 4-foot panels on stringers supported by Acrow shores. Cubical concrete blocks raise the 15½-foot shores to the necessary 17-foot height.

C&E Staff Photos

Concrete delivered in a Challenge mixer, mounted on an International truck, is hoisted to a collector-flume pour by a Browning truck crane with a Gar-Bro 1¼-yard bucket. Uni-Forms are used to form the flume.



Careful job planning cuts construction cost

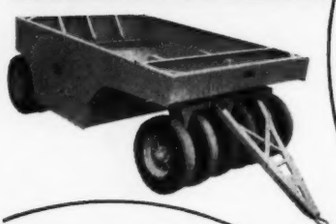
Well planned forming and shoring operations speed concrete work on Texas water-filtration plant

Planning the job properly and then following through with careful attention to details can develop a profit even where competitive bidding has forced prices down. This principle is being effectively demonstrated on the construction of the O. N. Stevens water-filtration plant for the city of Corpus Christi, Texas. The 48-mgd plant, which is located at Calallen, about 15 miles west of Corpus Christi, is one of the largest construction projects in that area in recent years.

The general contractor for the project, a joint venture of C. H. Leavell & Co., El Paso, Texas, and Coastal Bend Construction Co., Corpus Christi, was low among 12 bidders with a proposal to construct the plant for the sum of $3,408,000. The second low bid was $3,482,180, and the engineer's estimate was $3,465,000. However, the contractor expects to have earned a reasonable profit on practically every phase of the work by the time the job is completed this September.

The plant is somewhat unusual in design in that the primary and secondary flocculation and settling tanks and the filter beds are combined in a single structure. The water flows from one stage to the next through flumes which are built into the walls of the units. Thus, the principal plant units make up a structure 284 feet wide and nearly 900 feet long. This design dif-

TAMPO means Compaction



PNEUMATIC-TIRED ROLLERS

★ Three Models:
9 wheel with 60" rolling width
11 wheel with 84" rolling width
13 wheel with 84" rolling width

★ Oscillating axles for uniform compaction and longer life.

★ Most versatile roller ever used on road or airfield construction. Ground pressure per linear inch of rolling width can be varied from 47 to 325 lbs. Can be pulled by average size, pneumatic-tired tractor at speeds to 12 M.P.H.

SHEEPSFOOT ROLLERS

★ 40 and 60 inch Drum Diameters.

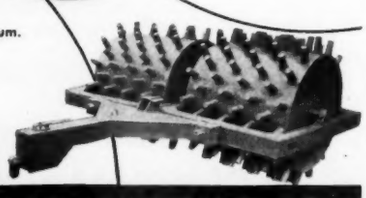
★ Independent Oscillation of each drum.

★ Spring-in-tongue absorbs shock.

★ Roller bearings adjustable from outside. NO SHIMS to insert.

★ Rugged and easy to pull.

TAMPO



TAMPO MANUFACTURING CO.
1146 W. Laurel St., San Antonio, Texas

IT'S NEW!

Famous "TRIPLEX" Has a New NARROW Ditch Tamper that Backfills...

FASTER TIGHTER EASIER

Now, one tamper man can do a 5-man job, yet work safely from surface level! The NEW "Triplex" Ditch Tamper has newly-designed handlebars—adjustable both *vertically* and *horizontally!* Real Power—Easy Operation in trenches as narrow as 10", as deep as 5'.

All this PLUS:

1. Highest compaction to any density on *all* soils.
2. Exclusive air filter.
3. Positive and correct manifolding of air.
4. Horizontally swinging, swivel air-intake.

Write for "Compaction Handbook" and further information on the NEW "TRIPLEX" Ditch Tamper

GUNDERSON-TAYLOR MACHINERY COMPANY
1237 Shoshone Street • Denver 4, Colorado

An International TD-18 tractor with Bucyrus-Erie dozer backfills around the high-level pumping station and clear well. C. H. Leavell & Co., El Paso, Texas, and Coastal Bend Construction Co., Corpus Christi, were the joint-venture contractors.

A White winch truck lifts precast wash-water troughs for the plant filters out of forms, using Superior lifting inserts cast in the troughs. Forms for these 4,000-pound units consisted of a concrete mold inside and Uni-Form panels outside.

fers from the more conventional plan, in which the plant components are usually built as separate units and are connected by pipes or flumes.

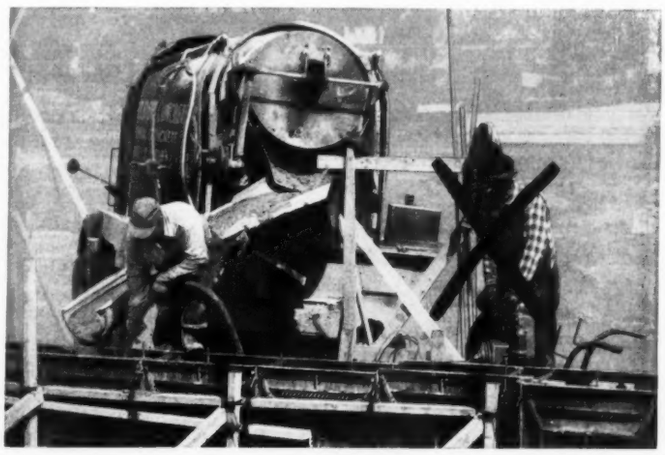
In addition to the main plant, the contract includes the construction of an inlet structure at the Nueces River about a mile and a quarter away, a chemical building containing large overhead tanks from which dry chemicals will be measured and fed to the raw water, a four-million-gallon clear well, and a high-level pumping station. Two 54-inch lines connecting the inlet structure and the plant were built under a separate contract. A 300,000-gallon elevated steel wash-water tank was constructed under still another contract.

Openings in tank walls

In planning his operations, the contractor foresaw the difficulty of setting heavy plant machinery in the big settling tanks. Relatively heavy lifts at long distances indicated the necessity of using a large crane with a long boom. Placing concrete for the floors and interior flumes after the outside walls were in place would have necessitated bucketing the concrete over the walls and then transporting it in buggies inside. Both of these costly operations were eliminated by leaving openings in the tank walls large enough to admit tank trucks and other equipment.

A ramp was graded down to the floor level of the secondary settling tank, and a section of the exterior wall of this tank was omitted at the time the other exterior walls were being formed and poured. Openings were then left in the walls between the several compartments of the huge tank to provide access to each of the units.

Concrete for the floors of the tanks was chuted directly into place from transit-mix trucks which drove down the ramp. Concrete for interior flumes and other elevated pours within the



NEW MASTER "1-MAN" VIBRATOR CUTS VIBRATING COSTS IN HALF

Only 25 lbs. Easy to handle.

It weighs 25 pounds! It's all in one piece! It plugs into any regular 115 Volt AC or DC electric line . . . and with no heavy engine or motor to drag around, one man handles it easily.

The motor is sealed in the vibrating head, so there's no flexible shaft to get out of whack; no oiling or greasing problems; no kinking troubles.

No field maintenance is necessary: when motor head needs attention, snap it off and snap on a spare.

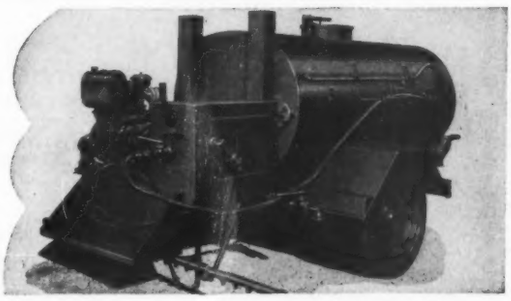
The vibration actually penetrates farther and leaves fewer voids in the concrete than old-style vibrators.

The price is *low*. The design has eliminated so much cost, and no special power source is required, but the big saving comes in use. Write for folder or ask your Master distributor for a free demonstration. You'll see exactly how the Master "1-Man" can cut your vibrating costs *at least* 50%.

MASTER VIBRATOR COMPANY
606 Stanley Ave., Dayton 1, Ohio

MASTER

STANDARD STEEL "S-J" *Maintenance Distributor*



DOES THE WORK OF BIG EQUIPMENT ON SECONDARY JOBS FOR LOWER COST

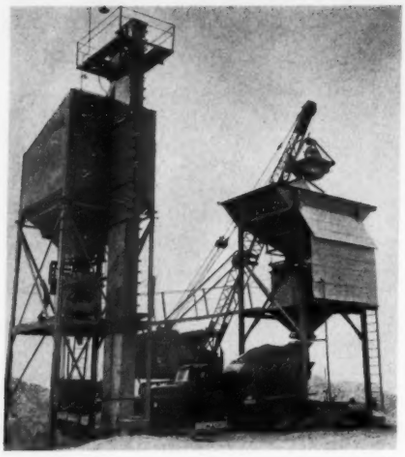
FULL CIRCULATING SPRAY BAR UP TO 10 FOOT LENGTH SEALS COATS AS PERFECTLY AS A FULL FLEDGED HEAVY DUTY PRESSURE DISTRIBUTOR

Standard Steel S-J Maintenance Distributor is available in either trailer or truck mounted type . . . the trailer unit can be quickly converted to truck mounting by removing tongue and running gear. A fuel pump throw out clutch is standard equipment on all models. The clutch disconnects the pump from engine when burners are not being used. The pump and piping provide the following features: (1) Pumps from tank through spray bar (2) Pumps from tank to hand spray (3) Pumps from tank to outside source (4) Pumps from outside source to another outside source (5) Pumps from outside source into tank. This versatility is a very great help in speeding operation of the S-J. Entire pump and piping as well as spray bar can be easily cleaned through its special suck back feature. Write for complete details on the 1955 Model S-J.

OTHER PRODUCTS OF STANDARD STEEL
ASPHALT DISTRIBUTORS . . . BURNERS . . . POWER AND TRACTION DRIVEN CONSTRUCTION BROOMS . . . MAINTENANCE DISTRIBUTORS . . . TAR KETTLES . . . AGGREGATE SPREADERS STREET FLUSHERS . . . PIPE LINE EQUIPMENT . . . SUPPLY TANKS SHELVING HARDWARE . . . AND AGRICULTURAL EQUIPMENT

Built to the Highest Standard

Standard Steel Works NORTH KANSAS CITY, MO., U. S. A. SJ8



This Ingram plant produced concrete for the project. A Link-Belt Speeder LS-88 crane with Owen clamshell bucket charges the 16-yard two-compartment aggregate bin, while a Challenger truck mixer loads below.

(*Continued from preceding page*)

tanks was handled by a Browning ¾-yard truck crane using a Gar-Bro 1¼-yard concrete bucket. Here again, the transit-mix trucks drove right in on the tank floor and the crane made only the vertical lift of about 20 feet.

When the mechanical equipment for the flocculators arrived, it was hauled right into the tank on semi-trailers and set in place by the same Browning truck crane. As each unit was completed, the closing wall section was formed and poured, until finally the last piece of construction machinery climbed the ramp and the breach in the exterior wall was closed. Thus by careful planning, the concrete was placed very economically, and one small crane did a job which might otherwise have required a much larger machine—possibly more than one.

Excavation and pipework

For a project of this magnitude, the construction time was very short. Work was started in May of 1954, with the plant scheduled to begin operation early in September of 1955. Careful coordination of all activities is enabling the contractor to complete the work in that short period without a large crew of workmen or an excessive amount of equipment.

Excavation was sublet to Condon-Cunningham Co., Omaha, Nebr. Most of the dirt was moved by four Caterpillar DW10 and DW20 scrapers, which were push-loaded by an Allis-Chalmers HD-19 tractor. Another HD-19 equipped with a dozer assisted in this operation. The excavated material was utilized for grading the site or stockpiled for use in backfilling around the structures.

One of the early items in the project was the construction of 2,600 feet of 36-inch reinforced-concrete pipeline to conduct the waste wash water from the filters to a disposal area. Most of the trench for this pipeline was dug by a Schield Bantam backhoe. This rig, though seemingly a small machine for the job, easily dug a trench which averaged more than 12 feet in depth. At the upper end, where trench depths increased up to a maximum of 25 feet, the trenching was done by a Lima Paymaster dragline using a Hendrix 1-yard bucket.

Pipe was handled by a White winch truck equipped with a shop-made boom, and by the Browning truck crane. A 48-inch water main connecting the plant with the municipal distribution system had been previously constructed under a separate contract. Because of the compact arrangement of the plant units, there was relatively little underground piping in the plant-construction contract.

All of the plant structures are founded on spread concrete footings cast on sand and caliche. Footing holes and trenches were dug by the Schield Bantam backhoe and concrete was chuted directly from transit-mix trucks.

Concrete work

Practically all flat concrete surfaces in the plant were formed with Uni-Forms. These handy steel and plywood panels were used to form walls, columns, floors, and roofs. They were quickly erected by a relatively small crew of workmen, and required a minimum of exterior bracing.

To form the 18-foot-high columns which support the roof of the clear well, the contractor fabricated forms of plywood and 2×4's to the exact dimension of the narrowest sides of the columns. Standard Uni-Form panels were set up to form the other two sides and the forms were clamped together with Symons column clamps.

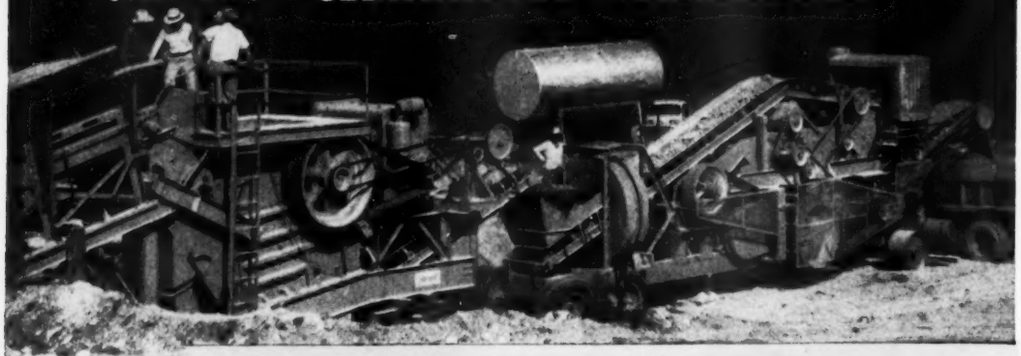
The roof of this structure was also very quickly and economically formed. The longest available Acrow shores —which extend to 15.5 feet—were too short for the 17-foot shoring height; consequently, they were set on pre-

MEMO-

Here's how to get the capacity and flexibility to handle a wider variety of contracts

It's pretty hard to beat a Cedarapids Commander for high daily tonnage and economical performance . . . especially if your job requires big volumes of finer sizes, or if you're working a pit with a high percentage of fines. The Commander, with its big 30" x 25" roll crusher and large screen, was specifically designed to increase output on such jobs, yet it has proved highly versatile for handling a wide variety of conditions while hanging up production records of 200, 300 and 400 or more tons per hour!

Start with a CEDARAPIDS COMMANDER



add a PORTABLE PRIMARY with VIBRATING GRIZZLY to turn 100% of pit-run material into specification aggregate

With a Cedarapids Portable Primary to handle the heavy crushing load ahead of your Commander, you can turn *all* the pit-run material . . . even big boulders . . . into specification product. You can re-open pits previously considered exhausted, open up new deposits that were considered unworkable because of oversize, or move into quarries close to your job. You'll have the capacity and flexibility to handle a wider range of profitable contracts.

And to step up production still more, be sure your Portable Primary is equipped with a Vibrating Grizzly. Located between the feeder and the crusher, it by-passes fines and undersize material before they reach the crusher. Wet, sticky material is easier to handle, output of the primary crusher is increased up to 25%, and maintenance costs per ton of finished product are reduced. With this set-up ahead of your Commander, you'll have a plant that can't be outproduced in any pit or quarry!

add a PORTABLE DOUBLE IMPELLER IMPACT BREAKER for big-volume rock crushing operations

Used as a Portable Primary, the Cedarapids Double Impeller Impact Breaker gives you high capacity production of desirable cubical shaped aggregate or road rock at low cost, under normal or adverse conditions. The extremely high ratio of reduction, reducing rock from 36" x 45" in size down to 1½" minus in one pass, plus the breaking of rock against rock in suspension, assures high tonnages with low maintenance.

Cedarapids Built by IOWA

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

cast-concrete blocks which rested on the floor of the tank. Rows of shores were set at 4-foot intervals, with the individual shores in the rows spaced about 6 feet apart. Double 2×8 stringers were placed on the rows of shores, which were held in alignment with a few 1×6 cross braces. Uni-Forms 2 feet wide and 4 feet long were laid across the stringers to complete the deck form. The only cutting and fitting of lumber was that required to form drop panels around the column heads. Floor and roof slabs in the chemical building and filter building were formed in the same manner.

All concrete for the plant was produced and delivered by Wright Bros. Materials Co., Robstown, Texas, which set up a batching plant on the job site. The Ingram plant consisted of a 16-yard two-compartment aggregate bin and a 250-barrel cement plant. Local aggregates were delivered to the plant by truck and charged to the bins by a Link-Belt Speeder LS-88 crane using an Owen ¾-yard clamshell bucket. The crane was powered by a Caterpillar diesel engine. Cement was delivered in bulk trucks from the Halliburton Portland Cement Co., Corpus Christi. This cement was made from shell.

Concrete batches were weighed out into Challenge 4½-yard mixers mounted on International R-170 trucks, and the concrete was mixed in transit. The two units of the batch plant were located close together, and the operator's platforms were joined by a walkway. Thus, when pours were small and there was no particular rush, a workman could weigh out the aggregates into the truck-mixer and then cross the walkway to weigh out the cement without having to climb down to the ground and back up again. During larger pours, two operators were used.

Wherever possible, the concrete was chuted directly from the truck-mixers. This applied to footings, floors, and other pours. Concrete for walls and slabs was handled by the Browning crane and Gar-Bro bottom-dump bucket. A few pours were made with a concrete bucket on a Scoopmobile C. Mall electric and gasoline-powered vibrators were used to consolidate the mix.

Precast flumes

Another instance of a seemingly difficult operation which was simplified and even made profitable was the precasting of the wash-water troughs for the filters. Each of these flumes is 17 feet long, 27 inches wide, and 21 inches high (outside measurements). They were designed with 3-inch walls, and were intended to be cast in place. Realizing that it would be costly and difficult to form and cast 144 of these troughs in place in the filters, the contractor requested and was granted permission to precast the units.

To simplify the precasting operation, the contractor's engineers modified the design slightly to provide a wall tapered from 4 to 3 inches instead of one of uniform 3-inch thickness.

The contractor then prepared a casting bed and molded a series of concrete forms to shape the inside of the trough. Uni-Forms for outside panels with cross bracing between adjacent forms made a very simple and sturdy form which stood up perfectly under many re-uses. The concrete center form was coated with Hunt Process Clear 225-TU wax-base separating agent to break bond with the trough.

The troughs were cast upside down so that the flat bottom was up. Four Superior lifting inserts were cast into each trough. To lift the troughs out of the form, two short pieces of angle were attached to the coil inserts, and a spreader bar was attached to the angles. The White winch truck lifted the 4,000-pound units out of the form and stockpiled them until they were needed. When the walls of the filters were being formed, the precast troughs were set into place in the forms by the Browning truck crane, and the walls cast around them.

Flocculation and settling tanks and filters have open tops. The operating galleries which are located between the filter beds have concrete roofs and glass walls. Radiant heating coils in the terrazzo floors of the operating galleries assure comfortable working conditions during cold weather.

Walls of the chemical building, pump house, and parts of the filter building are of brick. The crews laying up these walls used Adjustomatic scaffolds. A very useful feature of these scaffolds was the built-in two-sheave hand hoist for raising materials from the ground to the scaffold. This attachment was used for hoisting the pails of mortar to the scaffold.

For raising the brick to the crews on the scaffold, a Mulkey portable elevator was used. This 40-foot conveyor-elevator of the chain-and-flight type proved to be a valuable time-saver for the bricklaying crews. In fact, when the elevator was brought in, it immediately changed the bricklaying operation from one of loss to a profit item in the job-cost accounts.

Keep men, machines busy

One of the keys to the economy of this project is that men and machines are kept busy as much as possible. For example, when there was no other work for the crane, it was used with a Hendrix ⅝-yard dragline bucket to backfill around the structures. In the time between concrete pours which

for high-speed superhighway and airport work . . .

MORE AND MORE CONTRACTORS CHOOSE

BLAW-KNOX

CONCRETE SPREADERS AND FINISHERS!

They offer advantages found in no other comparable units!

- The Blaw-Knox Spreader-Vibrator is the *only* unit with the vibrator attachment designed as an integral part of the machine. No extra engine needed! Only one operator required!
- It's the *only* spreader with a transverse blade which spreads laterally and longitudinally at the same time . . . easily spreads extremely harsh, dry concrete as fast as it's placed, regardless of where it's dumped on the subgrade.
- It's the *only* spreader that easily converts to half-width and full-width paving. The 10′-15′ unit converts to a 20′-25′ width and vice versa.
- Exclusive Blaw-Knox Finisher features include structural design that minimizes weaving and lateral thrust; extra-wide screed ends to prevent wastage; traction and screed speeds are independently controlled to permit selection of best combination depending upon mix.

ASK ABOUT THE BLAW-KNOX "Complete Paving Package"

Before you bid your next job, check the profit-benefits of using a balanced fleet of units with one-source, one-responsibility economy and production advantages.

BLAW-KNOX

BLAW-KNOX COMPANY

CONSTRUCTION EQUIPMENT DIVISION

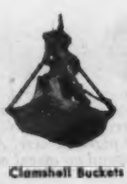
Pittsburgh 38, Pa.

Offices in Principal Cities

SEE YOUR BLAW-KNOX DISTRIBUTOR . . . **TODAY!**

Ask about the Blaw-Knox "Complete Paving Package"

Precision Subgraders



Clamshell Buckets

Batching Plants

MultiFoote Concrete Pavers

might otherwise have been wasted, the concrete crew kept busy placing the gravel and sand in the filter beds. These men also used grinder attachments on the Mall mechanical concrete vibrators to work exposed concrete surfaces during slack times.

Personnel

The men who are responsible for the economical operation and planning of this job for the contractor are Darrell J. Bandy, project manager, and Woodrow B. Brady, superintendent, both of C. H. Leavell & Co. The project was designed by Reagan & McCaughan, consulting engineers, Corpus Christi, who were represented on the job by W. E. Ziese, resident engineer. Russell E. McClure is city manager of Corpus Christi. THE END

Engine-starting fluid in spray dispenser

■ A simple method of starting gasoline and diesel engines in midwinter cold is reported by Spray Starting Fluid Co., Box 854, Camden 1, N. J. The concern is now marketing Spray, a fast-igniting fluid packaged in pocket-sized cans. An atomizer attachment supplied with the fluid injects it in the form of a fine mist into the air-intake stream as the starter turns over the engine.

According to the manufacturer, the fluid has been reported to be an effective engine starter by contractors who have used it in cold northern locations. It is also expected to be useful to contractors doing snow-removal work, who need a dependable means of starting plows and graders before drifts begin to pile up.

In addition to cutting down delays in work, the starting fluid reduces wear and tear on the engine and on the equipment.

For further information write to the company, or use the Request Card at page 18. Circle No. 438.

Minneapolis-Moline news

The former export manager for Minneapolis-Moline Co., Philip W. Mortimer, has been made director of exports for the firm. Succeeding him as export manager is Peter J. Blake, Jr. The firm, located in Minneapolis, Minn., makes engines, highway mowers, tractors, and other products used in the construction field.

This optical plummet is one of two new wind-free plummets introduced by David White Co.

New wind-free plummets

■ Two new wind-free plummets, one an optical type and the other a telescopic-rod type, have been announced by David White Co., 315 W. Court St., Milwaukee 12, Wis.

In contrast to the plumb bob, the automatic optical plummet is self-leveling, light in weight, and is not affected by high winds.

This new plummet is designed around a double-image sighting system. The observer looks through a window at the side to see two images of the stake tack. These two images move into coincidence when the instrument is directly over the tack.

The telescopic-rod type has a rod made of aluminum alloy tubing. It is fitted with an 8-minute level vial, giving an accuracy of 1/64 inch in its entire length. This can be reduced to zero by turning the plumb rod through 180 degrees and centering the bubble reading.

Adapters are available to fit both devices to all popular and recognized makes of European and American surveying instruments.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 425.

Abrasive cutting machines

■ A bulletin on its new line of Speed-Cut abrasive cutting machines has been released by Beaver Pipe Tools, Inc., Warren, Ohio. The literature illustrates both the No. 14 bench-type and No. 20 floor-type models.

The bulletin includes data on length of cutting time for various shapes and types of materials. Typical speeds are 5 seconds for 2-inch pipe, 40 seconds for 6-inch pipe, and 20 seconds for 2-inch cold-rolled bar stock.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 477.

STOODY 21 EXTENDS SERVICE LIFE OF DREDGE PARTS FROM TWO MONTHS TO FULL YEAR

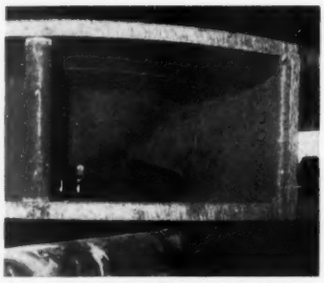
Dredges operated by the W. T. Burton Company, Inc., at Carlys, Louisiana, are used to recover shells from shallow under-water beds; this is the material from which the famous Louisiana shell roads are made. Thousands of tons of highly abrasive sand and silt are handled in the process.

Normally the cutter heads and impellers in such operations last about 60 days; hard-faced with Stoody 21, service life has been increased to a full year. As the hard metal is gradually worn away, the parts are again hard-faced and go back into service. Huge savings result in increased parts life and reduced down-time.

Most heavy equipment subjected to severe abrasive wear and impact can be given similar extended service life with Stoody 21. This material is a high alloy electrode, applied either AC or DC, and its rapid burn-off rate makes it ideal for protecting large surfaces.

Detailed application and procedure information is covered in the Stoody Guidebook that you can get from your Stoody Dealer (consult the Yellow Pages of your telephone book). Your dealer has a free copy waiting for you ... or write to the company.

Entire inner surfaces of cutter head are hard-faced ... approximately 250 pounds of Stoody 21 were required for the cutter head and impeller pictured here. Amount of material will depend on extent of wear. Outer surfaces of cutter blades are hard-faced along cutting edges only.

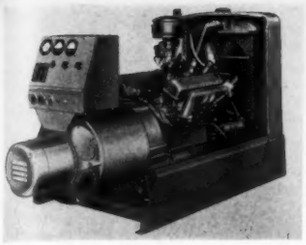


The entire impeller hub and the leading pressure faces of the vanes are hard-faced with Stoody 21; hard-facing is repeated until side discs are worn out, and hub is then welded into a new unit.

STOODY COMPANY

11936 East Slauson Avenue

Whittier, California



The 35ED, one of two new series of Onan electric generating plants rated at 25 and 35 kw.

Announce two new series of electric plants

■ Two new series of compact, Ford-powered electric generating plants have been announced by D. W. Onan & Sons Inc., University Ave. S. E., Minneapolis 14, Minn. The new series are the 25,000-watt 25EC and the 35,000-watt 35ED. Both feature Onan-built generators specially designed to have excellent motor-starting ability.

The generators are revolving-field units and have 2 per cent (plus or minus) voltage regulation and three-cycle frequency regulation. Features include a self-aligning semiflexible drive disk, drip-proof construction, all-climate insulation, constant-pressure brush springs, double-sealed prelubricated ball bearings, and automatic voltage regulator. All standard voltages are available for 60-cycle one-phase and three-phase models.

The Ford power units used are a 6-cylinder engine for the 25EC series and a V-8 for the 35ED. With increased compression ratios and reduced friction factor, these overhead-valve engines are said to deliver more usable power on less fuel than comparable units.

For further information write to the company, or use the Request Card at page 18. Circle No. 458.

Coated plywood panel resists weathering

■ A new weatherproof plywood panel made of exterior-grade fir has a coated surface said to resist checking, swelling, and grain raising. A smooth overlay sheet of Crezon, a resin-treated fiber, is bonded on one or both sides of the panel.

Light buff in color, Duraply is suitable for both interior and exterior applications. According to the manufacturer, it is unaffected by normal exposure to rain, sun, and freezing temperatures. Furthermore, its hard smooth surface is reported to resist wear and abrasion.

For exterior siding applications, Duraply can be used as a combination sheathing and siding, where local building codes permit. The material can be finished with only two coats of paint, as compared with three or more coats ordinarily required to cover fir plywood.

Duraply comes in sizes of 4 × 8, 4 × 9, and 4 × 10 feet. Thicknesses available are 5/16, 3/8, 1/2, 5/8, and 3/4 inches.

For further information write to United States Plywood Corp., Weldwood Bldg., 55 W. 44th St., New York 36, N. Y., or use the Request Card at page 18. Circle No. 424.

New truck-scale line

■ An expanded line of truck scales ranging from 60-foot platform models down to axle-load scales is illustrated and described in new literature from Toledo Scale Co., Toledo 1, Ohio.

Known as the Toledo "Hi-Weigh" line, these scales feature the latest type of double-pendulum mechanism in cabinet heads that regularly offer up to nine unit weights. There is parallel link platform suspension to absorb lateral platform movement. Pivots are self-gaging, so that if a replacement is ever necessary, the new pivot is automatically in gage, and full original accuracy is maintained.

Particular emphasis is placed on the new features offered in the weighbridge construction and pit design which, it is claimed, achieve not only higher strength but important economies in installation.

Three groups of scales are available in the new line: axle-load scales in 20 or 30-ton capacities; two-section truck scales in capacities to 30 tons; and four-section truck scales in capacities to 60 tons.

To obtain Form 2417a write to the company, or use the Request Card at page 18. Circle No. 482.

Self-propelled mower cuts 85-inch swath

■ A self-propelled three-gang mower is illustrated in a leaflet from Worthington Mower Co., Stroudsburg, Pa. The new Worthington Triplex shown consists of a mower and riding sulky built as an integral unit.

Performance features described include the unit's ability to climb slopes up to 36 per cent. The Triplex cuts a swath 85 inches wide.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 410.

Contractor's check list for specifying ASPHALT

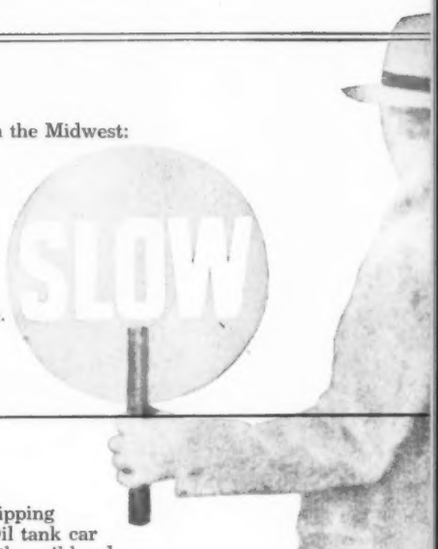
1

CONVENIENT SHIPPING SOURCES

Standard has 5 centrally located shipping points in the Midwest:

Wood River, Ill.
Whiting, Ind.
Casper, Wyo.
Neodesha, Kans.
Sugar Creek, Mo.

Asphalt from Standard Oil gets shipped to you direct from the shipping point nearest your job site. Shipments get to the site faster, keep you on schedule.



2

TANK CAR AND TANK TRUCK SHIPMENTS

Shipments can be made from any Standard Oil shipping point in either tank car or tank truck. Standard Oil tank car service keeps contractors supplied with asphalt at the rail head as needed. Tank truck deliveries permit shipment directly to the job site, often saving heat-up to unload, and making possible unloading directly at the batching plant.

3

RELIABLE SOURCE OF SUPPLY

A reliable source of supply means three things to a contractor:

1 A supplier that delivers according to contract *when needed.* Standard Oil recognizes this as a prime factor in contracting for asphalt, delivering as the contractor needs material.

2 A supplier familiar with the contractor's problems. Standard has been supplying asphalt to contractors in the Midwest for many years. Standard salesmen know contractor's problems . . . know how to give him service.

3 A contractor must have dependable sources of supply. Taking care of its customers through periods of short supply as well as delivering when materials are plentiful is the kind of service contractors need, want and get from Standard. With the big program of road construction now under way and promises of even bigger programs to come, an assured, dependable source of asphalt is a must for every road building contractor.

Check this list, then check with Standard. In the Midwest contact your nearby Standard Oil office. Or write, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY (Indiana)

YOURS! single lift compaction!

ADJUSTABLE! WIDE or NARROW COURSES from 8'-6" to 13'-2"

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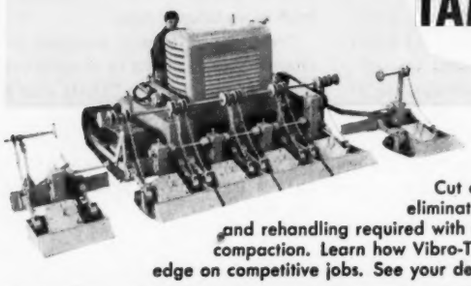


MACADAM CONCRETE

Cut compaction time and eliminate cost of stock-piling and rehandling required with old-style multiple-lift compaction. Learn how Vibro-Tamper gives you the edge on competitive jobs. See your dealer, or write today!

THE INTERNATIONAL VIBRATION COMPANY
16702 WATERLOO ROAD • PHONE IV. 6-0680 • CLEVELAND 10, OHIO

The new Smith Model 45-P compressor.

Portable compressor rated at 45 cfm

■ Portability and low-cost operation are reported to be features of the new Smith 45-P portable compressor. Designed to supply air for a wide range of machines, the new model is rated at 45-plus cubic feet per minute. It will operate either a light paving breaker, a backfill tamper, a clay digger, or two large chipping hammers.

The unit is powered by a Wisconsin air-cooled 4-cylinder engine, with two cylinders used for power and two for compression. The small compressor may be towed at car speeds to the job site, and then hand-pulled to the exact spot where it is to be used.

The compressor, which features automatic unloading and idling, has stainless-steel valve disks with a manganese bronze valve body. It is equipped with a 9-gallon gasoline tank and a tool box. An electric starter and generator is furnished as standard equipment.

The new model now extends the Smith compressor line to four portable models, including the 75-P, 120-P, and 230-P. The line also includes more than a dozen stationary models.

For further information write to Gordon Smith & Co., Bowling Green, Ky., or use the Request Card at page 18. Circle No. 413.

New engine-driven welder

■ A new 200-amp engine-driven welder for pipeline welding and other types of construction has been announced by the General Electric Co., Welding Dept., Schenectady 5, N. Y.

Designated Type WD20AG, the new welder is NEMA-rated for a current range of 40 to 250 amps and will handle all dc or ac and dc electrodes from 1/16 to ¼ inch in size.

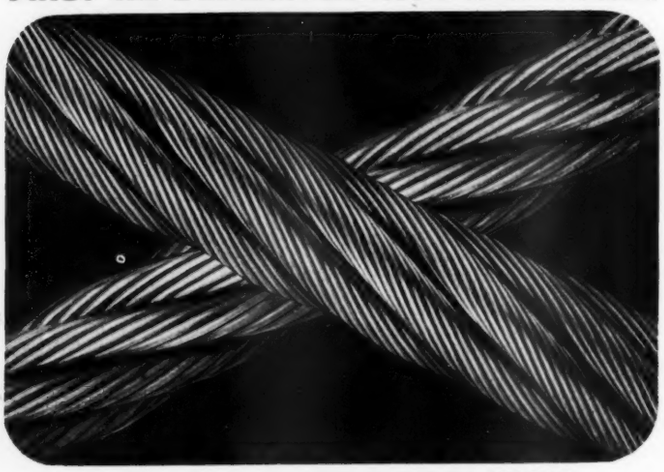
According to the company, the unit's performance features minimum load drop-off as the welder heats up, good arc and fast response, ease in arc starting, and a high instantaneous recovery voltage that prevents pop-outs.

The direct-driven generator has a laminated frame with dovetail-mounted poles and precision-wound coils. Brush holders are fixed at the right setting and brushes are held by constant-force springs, so that no adjustment is necessary.

A Hercules engine, operating at 1,750 rpm, keeps the generator running over 13 hours at full-load rating, 60 per cent duty cycle, on a tankful of gasoline. A vacuum-operated slow-down control with adjustable time delay reduces engine wear and gasoline consumption.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 402.

FIRST WE DEVELOPED 1105 ROPE WIRE.



THEN WE MADE ROEBLING'S

Royal Blue

WIRE 1105 ROPE

1105 takes Royal Blue out of the ordinary wire rope class.

1105 is a rope wire that's new—that's stronger. It's the biggest news in many years.

1105 is the result of more than a century of research and development—it's the wire that gives Roebling Royal Blue the stamina that pays off in service.

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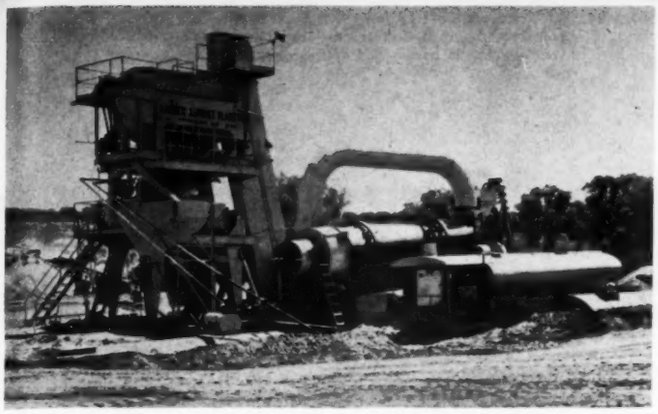


Contributing to the portability of this Madsen asphalt plant is a Clayton portable steam generator mounted at the rear of the diesel oil and water tank unit shown at right. The Clayton generator is ready to operate within 5 minutes after hook-up of steam lines to the plant and drier has been made. This equipment is being operated by United Concrete Pipe Corp., of Baldwin Park, Calif.

"I'll take it."

Portable steam generator goes to remote jobs

■ A portable steam generator for use on construction jobs in remote areas has been developed by Clayton Mfg. Co., El Monte, Calif. The Clayton generator can be mounted on a trailer and brought directly to the job site. After being hooked up to steam and water supply lines, the generator is ready to supply steam under pressure in five minutes.

Such equipment is being used to operate mixing plants, pile hammers, and other construction machinery in locations inaccessible to steam generators not designed for portability.

In one important application, the McKiernan-Terry Corp., New York, N. Y., has adapted the Clayton unit to its McKiernan-Clayton steam generator designed expressly to generate steam for pile hammers. Mounted on the tail of a diesel, a crane, a trailer, or on skids, the unit provides a compact and economical pile-driving rig.

Powering the various versions and adaptions of the Clayton generator are Kohler engines.

For further information write to the company, or use the Request Card at page 18. Circle No. 428.

New air-entraining agent

■ A new air-entraining agent has been announced by W. R. Meadows, Inc., 7 Kimball St., Elgin, Ill. Sealtight air-entraining agent is a clear, low-viscosity, homogeneous liquid that is said not to settle out or become gummy. According to the manufacturer, it retains its efficiency while stored in low winter temperatures.

The agent is available in single and double-strength solutions. The addition of ¾ to 1 ounce of this agent to the mixing water for each sack of cement gives a 3 to 6 per cent volume of entrained air in the mix.

The manufacturer reports that Sealtight air-entraining agent meets all essential specifications and is accepted as an approved material by ASTM, the U. S. Bureau of Public Roads, the U. S. Army Corps of Engineers and other organizations.

For further information write to the company, or use the Request Card at page 18. Circle No. 470.

MULTI-PURPOSE LOADERS SAVE MONEY

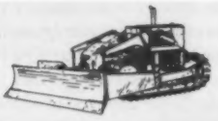
Examples of many uses for Eimco 105 Tractors with excavating attachments are sent in by Eimco's field engineers. The customer buys his Eimco for loading but usually finds that it also performs many additional jobs that make the 105 pay for itself quickly in bonus work.

The picture above shows an Eimco high discharge excavator attachment on an Eimco 105 Tractor loading into an ore bin. The owner decided he could save time by cutting a new road into his pit and found the 105 could cut its own road.

Many other Eimco 105 owners are finding them ideal for ripping up old curbs and paving, tearing out old foundations, digging ditches, basements, patching highways and many other jobs in the heat of the desert or the cold of the Yukon — Eimcos are tops on any job anywhere.

Write for more information.

Eimco 105



Eimco 105 with bulldozer attachment

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Texas Birmingham, Ala. Duluth, Minn. Kellogg, Ida. London, Eng. Paris, France Milan, Italy

Three stages of Stang wellpoints keep the big excavation dry during construction. A series of electric pumps—two for the lower stages located in the buildings—lift the water over the banks and discharge it into the river.

C&E Staff Photos

Closely timed spillway work

Fine-grading is done after anchor holes and bars, grout, and form work are in place at Gavins Point Dam

(See companion article on pages 22–23)

Rapid weathering of the surface of the Carlisle shale on which the Gavins Point Dam structures are founded created what seemed to be an unsolvable problem in placing the spillway slab, for as soon as this shale was exposed to air it began to soften and crumble. It soaked up water and turned into a sticky mud when it got wet. Retaining a firm surface on this material as concrete was placed required careful preparation and a cooperative weatherman.

Specifications provided that the surface of the shale be sprayed with a bituminous seal within 2 hours after it was exposed. If concrete was not poured on it within two days, the surface was to be further protected by the application of ½ inch of gunite. But even these measures failed to protect the top layer against rain and prolonged exposure, and it became necessary to excavate below planned grade in a number of cases to remove the weathered material.

Structure footings did not cause too much trouble because the concrete could usually be placed as soon as the excavation was completed. But after spillway excavation was completed and before concrete could be placed, it was still necessary to do some fine-grading, drill holes for

Flexibility like this pays off underground

This 28-ft-long Beth-Cu-Loy culvert pipe is flexing under its own weight to illustrate one of the special advantages of pipe fabricated from galvanized Beth-Cu-Loy sheet steel: its flexibility. And flexibility pays off several ways underground.

Flexibility allows the pipe to conform to irregular grades in the trench. It permits the absorption of changing loads caused by shifting soils or freezing action. And because a culvert made from Beth-Cu-Loy is flexible both transversely and longitudinally it can withstand greater impact and vibrational stresses than rigid materials.

Drainage pipe made of Beth-Cu-Loy has other advantages, too. Weighing only a fraction as much per foot, it can be handled in longer lengths than comparable pipe of other materials. It requires fewer field joints, and no special lifting equipment.

Bethlehem does not fabricate drainage pipe, but does manufacture the Beth-Cu-Loy galvanized corrugated and flat steel stock used by pipe fabricators. This copper-bearing steel carries a heavy coating of zinc and has excellent resistance to corrosion. It more than meets the specifications of the AASHO.

If you would like to have further information about Beth-Cu-Loy, or the names of those who fabricate it into pipe, just get in touch with the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

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Anchor bars have been set, grouting completed, and forms finished before this small John Deere Model MC tractor-dozer maneuvers between anchor bars to remove the thin covering of weathered shale and bring the base to grade.

wor revents weathering of shale

anchoring the slab to the shale, set and grout anchor bars, set the forms, and place reinforcing. All these steps required time—and it turned out to be ample time for weathering to begin before concrete could be placed. The core of the problem—decreasing the time span between fine-grading and concrete placement—was solved when the contractor rearranged the sequence of these operations so that concrete could be placed shortly after fine-grading was done.

Excavating Spillway

Initial excavation of the spillway and powerhouse areas was made during the construction of the earth-fill dam. The Niobrara chalk strata overlaying the Carlisle shale provided much of the impervious material for the core of the dam. During excavation, three stages of Stang wellpoints were installed around the area to keep it dry. A series of electric pumps in the wellpoint system lifted the water over the banks and discharged it into the river. The pumps were powered from a 33,000-volt REA transmission line, with the voltage stepped down through transformers and distributed through the construction area at 440 volts. Because of the possibility of failure of this power supply, two 1,000-kw diesel-generator units were kept ready for standby use. These were driven by General Motors 16-cylinder 1,440-hp diesel engines. One of these units was built on a trailer, and the other was a stationary unit enclosed in a temporary building.

When the initial excavation had been made, the grade was left high; then, as concrete work on the spillway progressed, the excess material was removed—most of it by a Bucyrus-Erie 54-B dragline and 50-ton Euclids.

Finish grading inside forms

The upstream portion of the spillway consists of an 18-inch concrete slab over a 42-inch gravel frost blanket on the shale. In this area the shale was excavated to grade and sprayed immediately with Presstite 137. Then the gravel blanket was placed, protecting the shale against further weathering until the concrete slab could be laid.

Further downstream, the slab thickens to 4 feet and is laid directly on the shale. Under the baffle wall there is a section of slab 7 feet deep and 50 feet wide which acts as a key. Below the baffle the slab continues at

(Continued on next page)

Automatic Free-wheeling 2-wheel drive for 4 W. Ds.

WARN *Automatic* HUBS

automatically engage or disengage the front wheels from the power train as you shift into 4-wheel drive, or back to 2-wheel drive.

Go farther, faster, easier—roads or no roads!

No matter where you drive, whenever you use 2-wheel drive it's fast, economical *free-wheeling* 2-wheel drive with Warn *Automatics*. For 4-wheel drive, shift! You have it, *plus something new*—torque-free high speed driving in 4 w. d.! Warn Hubs stop drag, save gas, gears, tires in 2 w. d.—make 4 w. ds. peppy as pick-ups! Install them now—use your 4 w. d. for any purpose! Automatic and Locking models for Willys at Willys Dealers only. For other 4 W. Ds. at dealers or write:

Warn Mfg. Co. Riverton Box 6064-C7 Seattle 88, Washington

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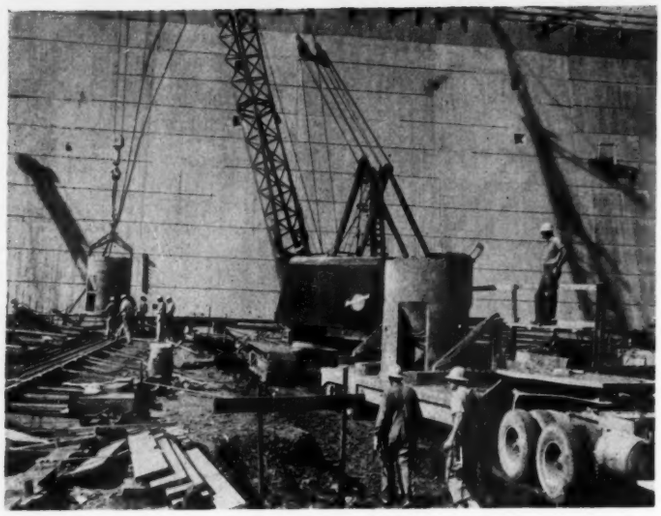

Just after fine-grading is done, a Manitowoc 3900 crane makes a pour near one of the side walls of the spillway. Concrete is delivered in a Johnson 4-yard air-operated bucket carried on a Fruehauf trailer.

(Continued from preceding page)

a depth of 4 feet to the toe. Placing these thick slabs directly on the shale was the operation which caused the contractor trouble.

When this phase of the work started, the contractor graded a considerable area of the shale to exact finished grade, applied the bituminous seal and gunite, and proceeded to place forms for paving the 24-foot strips of the spillway. But, before concrete could be placed, some of the shale had failed and it became necessary to carry the excavation deeper to remove this poor material. This caused extra delay and required additional concrete, and during the delay the other sections which had been exposed weathered still more.

Realizing that this was a losing battle, the contractor decided on another approach. The next section to be graded was left 0.2 foot high. The drilling rig then moved in and drilled the 6-inch dia. bell-bottom anchor holes. Another crew placed the 2-inch-square anchor bars in the holes and grouted them in with a Koehring No. 10 Mud-Jack. All anchor bars extended 10 feet into Carlisle shale. Their length varied, depending on the depth of the slab and whether the slab was directly on shale or a frost blanket. Forms were then set for the sides of the 24-foot strips of spillway paving. When all these things had been done and there remained only to place the reinforcing steel and pour the concrete, the finegrading was finished and the final coat of the Presstite sealing compound was applied.

To grade on the relatively steep slope with less than four feet of clearance between the anchor bars required an unusually small machine. A special dozer on a John Deere MC tractor met the requirements, and quickly removed the shale down to grade, pushing the loose material down to the low end of the forms where it was picked up and loaded into trucks by one of the draglines. This operation moved along quickly, and there was a minimum of hand work required.

As soon as the shale was down to grade, it was given a shot of Presstite 137 to seal the surface. The reinforcing steel was then tied in place as rapidly as possible, and the end form for the pour set in place. Concrete was placed in that section the same day that grading was completed. This close timing and the coordination of the several phases of the work involved proved to be the answer to the problem.

Concrete placement

The big C. S. Johnson concrete plant, in which all concrete for the project was produced, turned out a very stiff mix for the steeply sloping portion of the spillway slab. Some of the pours were made by a big Colby gantry crane operating from a trestle over the spillway. Concrete was delivered from the plant to this crane on railroad flatcars pulled by Plymouth and Brookville diesel locomotives. Each car carried three 4-yard

HIGH-WAY to lower construction costs!

MODEL C
SCOOPMOBILE
with high track

Most versatile machine you can own!

Model C's scoop, load, elevate, transport — perform all the conventional functions of a front-end loader. In addition, availability of demountable track extensions in 10- and 15-foot sections make them the *only* loader manufactured today that can be quickly converted to a mobile materials handling and elevating machine capable of high lifts up to 38 feet.

Interchangeable attachments—¾ yard scoop bucket, lift forks, 5-foot crane boom, ¾ yard concrete hopper, backfill blade — can be used with either standard or extended track, give multiple uses to fit almost any job situation.

Ask any owner. They'll tell you their Model C's don't owe them a dime! Before you buy, be sure to get the low-down on the high way to cut construction costs. Your Scoopmobile dealer has complete information. facts, and figures.

Model C elevating and pouring concrete with ¾-yd. concrete hopper and high track. Same machine with crane boom attachment also placed and removed forms on this job.

Model C with standard 12'-4" track and ¾-yard scoop attachment.

CHECK THESE MODEL C FEATURES

Three-wheel Maneuverability . . . Heavy-duty Industrial Engine . . . Power Steering . . . Planetary Drive . . . 4 Speeds Forward or Reverse . . . Powered Loading Action and Controlled Dumping . . . Lifting Capacity 4,000 Pounds . . . Road Speeds to 20 MPH . . . Tows from Job to Job.

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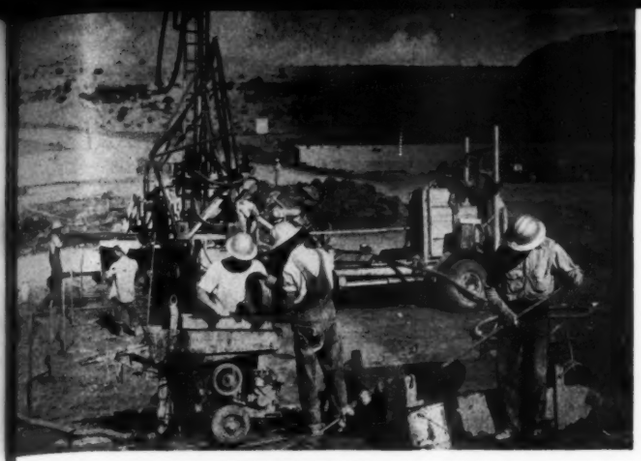


As a rotary drill makes 6-inch holes into the chalk and bells out their bottoms, 2-inch reinforcing rods are set and the holes grouted by the Koehring No. 10 Mud-Jack in the foreground.

"Hot, ain't it! Wonder how the boys on that power crane are making out."

Johnson concrete buckets and had room for an empty.

When the Colby crane was busy with other operations, a Manitowoc 3900 handled the buckets. In such cases, the concrete was delivered from the plant on a Fruehauf low-bed trailer pulled by a Mack truck. This rig handled two of the 4-yard buckets or three 2-yard buckets as required. The job was completed when the very stiff mix was vibrated into place with Jackson, Viber, Mall, and Chicago Pneumatic vibrators, and given a finish by a Stow vibrating screed. THE END

Catalog on explosives

■ A technical bulletin and catalog of electric blasting caps, blasting aids, and accessories has been released by the American Cyanamid Co., Explosives Dept., 30 Rockefeller Plaza, New York 20, N. Y. Covered in detail are instantaneous caps, split-second delay caps, and regular delay caps for quarrying and road construction.

Through tables, drawings, and photographs, the bulletin also discusses such general problems as electric detonation, modern blasting techniques, precision controls, specifications, rotation-firing techniques, electric firing, resistance of circuit wires, simplified blasting circuits, and blasting patterns.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 486.

Line of diaphragm pumps

■ A line of diaphragm pumps is illustrated in a folder from Rice Pump & Machine Co., Belgium, Wis. The units shown are available in 2, 3, and 4-inch sizes in both single and double-diaphragm models. Capacities range from 2,500 to 12,000 gallons per hour at a 10-foot suction lift.

Rice diaphragm pumps are regularly equipped with flat-type valves, but are also available with ball-check valves on special order.

To obtain Bulletin 55DP write to the company, or use the Request Card at page 18. Circle No. 460.

INTERNATIONAL...
Right From the Start or as Replacements

Houston contractor rates heavy-duty INTERNATIONAL engines tops for his equipment after 18-year check on their low-cost power and service

INTERNATIONAL UD-350 Diesel Power Unit operates this Insley K-12 back hoe shown excavating for a storm sewer in Houston subdivision. This engine is one of 18 IH carbureted and diesel engines from 17 to 214 hp available as original or replacement power plants in earthmoving equipment.

Take it from A. F. Pike, a general contractor in Houston, Texas, since 1937, INTERNATIONAL Power Units are the No. 1 power choice to get top production at lowest cost out of earth-moving machines.

Contractor Pike's Insley K-12 back hoe is but one of several machines he powers with INTERNATIONALS for these important reasons:

"I've been using INTERNATIONAL *engines since 1937 because they give me full-rated horsepower, and power my machines for lowest cost."*

International Harvester has been designing and manufacturing engines for heavy-duty use for more than 50 years and in that time have pioneered such engine features as all-weather starting, positive reserve torque control, valve-in-head construction, micronic oil filtration, and induction hardened crankshafts to name but a few.

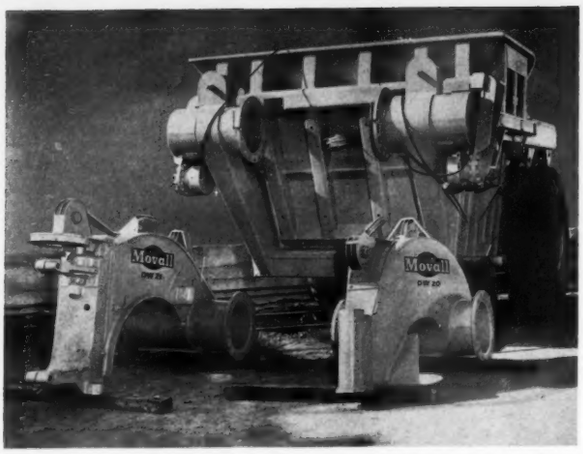
Get top production at lowest cost out of your machines by specifying INTERNATIONAL engines as original equipment or installing an INTERNATIONAL at repowering time.

Your INTERNATIONAL Industrial Power Distributor is the man to see for dependable cost and performance estimates and expert application assistance required to repower your machines with INTERNATIONALS. Call him today.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

INTERNATIONAL HARVESTER

INTERNATIONAL
INDUSTRIAL POWER
MAKES EVERY LOAD A PAYLOAD



New yokes for the Movall end-dump wagon make it easier to interchange the equipment with scrapers on Caterpillar DW20 and DW21 tractors. ►

End-dump wagon gets interchangeable yokes

■ Interchangeable yoke sections to fit Caterpillar DW20, DW21, and similar prime movers are a new feature of the C&D Movall dump wagon. The special goosenecks make the wagon more easily interchangeable with scrapers.

The changeover can be made in the field by two mechanics in 4 to 8 hours. Because the Movall has exactly the same front-end arrangement as scrapers, no modifications or extra assemblies are required.

With the appropriate gooseneck installed, the same basic Movall can be used interchangeably with either the Caterpillar DW20, DW21, or any prime mover with sufficient horsepower and with double-drum cable control. The Movall wagon features power ejection.

For further information write to C&D Mfg. Co., Perkins, Calif., or use the Request Card at page 18. Circle No. 415.

Tandem rollers feature torque-converter drive

■ A bulletin describing its new standard series tandem rollers has been released by the Buffalo-Springfield Roller Co., Springfield, Ohio. These units feature torque-converter drive that automatically maintains constant rolling speeds—regardless of grade—uphill or down. Compensating instantly for variations in materials and grade, the torque converter eliminates roller slippage and provides a continuous and vibrationless flow of power through the drive line.

Buffalo - Springfield's final drive transmits the power to the drive roll through a rugged bevel pinion and bevel-gear unit, providing the advantage of low tooth bearing pressures. Gears can always be set to operate with minimum back lash.

Complete information on size, weight, rolling speeds, and compression are included in the bulletin.

To obtain Bulletin S-68-555 write to the company, or use the Request Card at page 18. Circle No. 439.

Warning torch burns for long periods

■ The Flame-Guard is a new self-righting torch, designed for night use as a warning light on construction projects. Introduced by Anthes Force Oiler Co., Fort Madison, Iowa, the torch has a square-type burner and an umbrella-style hood, permitting a flame to burn from 24 to 48 hours, depending on weather conditions.

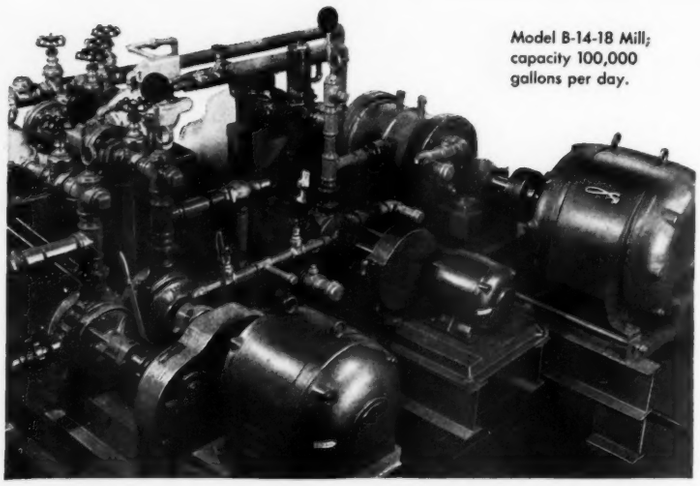
The cam-type coupling which locks the burner to the body of the torch is easily removed to permit the unit to be filled with kerosene or light fuel oil. The torch has no threads so that the coupling cannot be stripped or get stuck.

The 20-gage steel body of the Flame-Guard consists of two half-shells, double-seamed to prevent fuel from leaking out. Finished in bright-red baked enamel, the torch has a strong chain and a large ring which enable it to be carried while lit.

For further information write to the company, or use the Request Card at page 18. Circle No. 496.

The Flame-Guard with its umbrella-type hood and square burner.

WEATHER-PROOF ASPHALT EMULSIONS FOR BETTER PAVING



Model B-14-18 Mill; capacity 100,000 gallons per day.

QUALITY-CONTROLLED PRODUCTION
through mills of the type illustrated above

Besides producing asphalt emulsions which meet all specifications of A.S.T.M., A.A.S.H.O., Asphalt Institute, and the various state, county, and city public works departments... McConnaughay Licensees manufacture and recommend Weather-Proof Emulsions with these special qualities:

1. *Resistance to water during and after construction.* Weather-Proof Emulsions are not washed off during sudden or prolonged rains occurring immediately after mixing or spreading. Finished pavements are also resistant to water.
2. *Resistance to heat.* Weather-Proof Emulsion Mixtures do not bleed or soften during hot weather. Mixtures of emulsion and aggregate show great strength at 140° F.
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Complete test procedures and specifications will be mailed upon request. You can always be sure of getting accurate information and fast, dependable service on asphalt emulsions and mixes by calling any of the McConnaughay Licensees listed. Take advantage of this exceptional service. Get in touch with your nearest McConnaughay Licensee or contact...

SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

1 – Penetration Macadam. 2 – Open-Graded Plant Mix, 3 – Open-Graded Road Mix, 4 – Dense-Graded Plant Mix, 5 – Dense-Graded Road Mix, 6 – Mat Coat, 7 – Seal Coat, 8 – Sand Mix, 9 – Sand Honing, 10 – Patching, 11 – Mastic-Mix, 12 – Driveway Construction.

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EMULSIFIED ASPHALT *PLANTS AND PROCESSES*

The four-wheel-drive Model LT-400 Trojan Loadster is equipped with an Allison Torqmatic transmission which permits shifting from forward to reverse while the machine is in motion.

Shovel-type loader has four-wheel drive

■ A four-wheel-drive machine has been added to its line of rubber-tire shovel-type loaders, according to Contractors Machinery Co., Batavia, N. Y. The new Trojan Loadster has a capacity of 1½ cubic yards.

Equipped with an Allison Torqmatic transmission, the Model LT-400 can be shifted from forward to reverse while in motion. It can also be shifted from low to second, or to travel, at any time. This recent innovation in loader performance is available as a standard feature on the CMC unit.

Other standard Trojan Loadster features found on the Model LT-400 include reverse-curve safety arms, independent bucket action, low load-carrying position, and straight-line horizontal thrust.

With the addition of the new model, the CMC line now includes two and four-wheel-drive units ranging in bucket size from 12 cubic feet to 1½ cubic yards.

For further information write to the company, or use the Request Card at page 18. Circle No. 473.

Catalog on potentiometer

■ Accuracy in checking temperature measurement and control instruments —in the laboratory and in the field— is said to be afforded by the Wheelco portable potentiometer, manufactured by the Wheelco Instrument Division, Barber-Colman Co., Rockford, Ill.

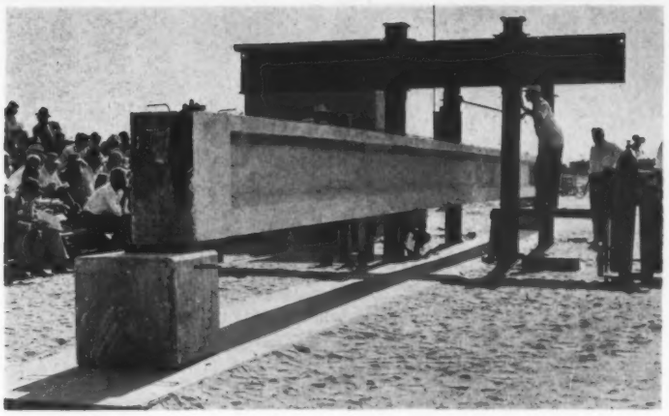
Bulletin F 5760-1 describes the unit and its features, together with the various models available. The potentiometer is readable to 0.025 millivolts and has a scale length exceeding 40 inches. Models are also available with a built-in run-up box and calibrated rheostat for line resistance compensation.

To obtain this bulletin write to the company, or use the Request Card at page 18. Circle No. 495.

Carver Pump appoints two

Kenneth Adams, Jr., has been made regional sales manager in the Southeast, and Warren Ball has been made west-central regional manager of the Carver Pump Co., Muscatine, Iowa, manufacturer of centrifugal pumps for construction, irrigation, etc.

Mr. Adams will work with distributors in Georgia, Florida, Alabama, Tennessee, and North and South Carolina. Mr. Ball will cover Iowa, Missouri, Kansas, Nebraska, Minnesota, and North and South Dakota.



Members of the Prestressed Concrete Institute watch a loading test of a 60-foot-long I-section girder at the W. H. Wright & Son, Inc., plant in Pompano, Fla. The delegation, attending a convention in Fort Lauderdale, also witnessed pretensioning and pouring operations at the Wright plant.

STOP costly infiltration...

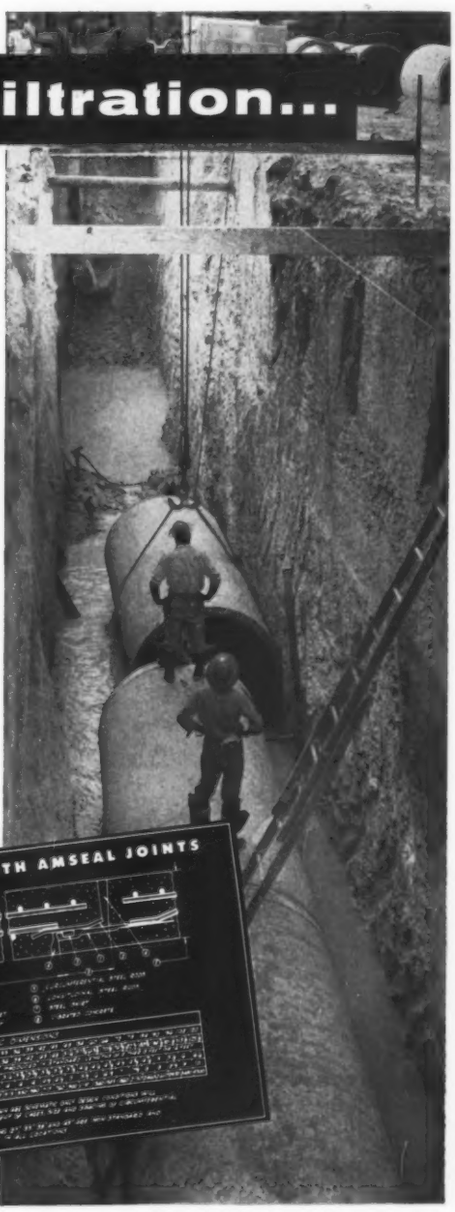
specify

AMSEAL JOINTS

Contractors appreciate the simplicity and economy of installing precast concrete pipe furnished with foolproof AMSEAL Joints—particularly where trench conditions are wet and troublesome. The continuous, round rubber gasket assures a watertight seal against infiltration or leakage. AMSEAL Joints provide the necessary flexibility to permit normal expansion, contraction, deflection and settlement without reducing their effectiveness.

The efficiency and long life of AMSEAL Joints results in *greater economy*—through savings in the construction, operation and maintenance of sewage pumping and treatment facilities. With pipe lengths of 16 feet, there is less joining—less time on the job. Inside surfaces are smooth for maximum capacity.

Write today for specifications on precast concrete pipe with trouble-free AMSEAL Joints.



This "pressure proven joint" is furnished on low pressure concrete pipe for:

- INVERTED SIPHONS
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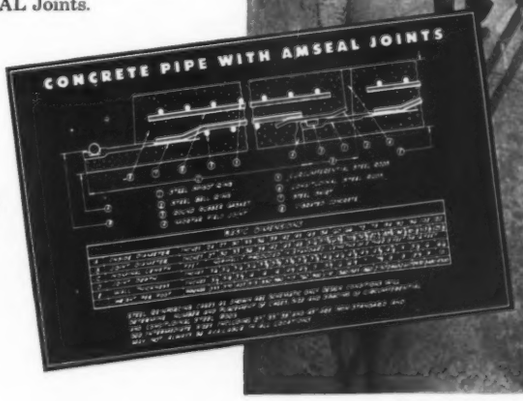

A-M

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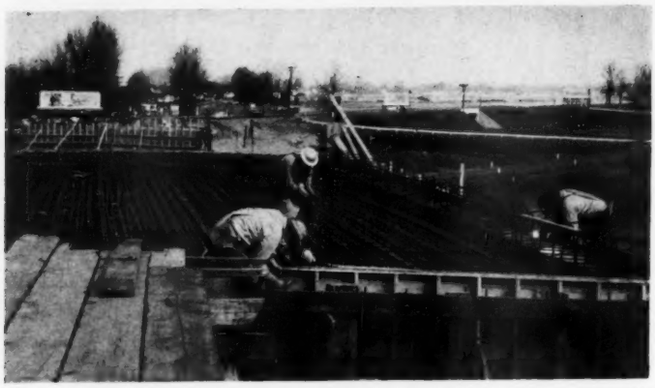


Workmen tie the upper mat of reinforcing steel in preparation for placing concrete on the deck span. Prestressing pull will be applied at the ends of the cables, shown emerging from the end forms at the bottom of the picture. *Ray Day Photo*

Unusual highway crossing has prestressed deck slab

When the Oregon State Highway Commission designed three types of bridge spans for one 336-foot structure, it created problems which required considerable ingenuity on the contractor's part. Specifications on this highway bridge job called for a box-girder span, regular reinforced-concrete girder spans, and a special prestressed deck-slab span without girder support.

The prestressed deck span, which uses the Prestress, Inc., method of post-tensioning, is the latest example of bridge-deck prestressing in the Pacific Northwest. It may also be a "first" for this area. There have been some cases of prestressing in girders, but the 104-unit 12-cable-per-unit layout is the first sizable use of prestress in a flat deck slab.

The unusual structure incorporating three span designs is the Denver Avenue Undercrossing on U. S. 99 in Portland, not far from the Columbia River Interstate Bridge. The purpose of the new undercrossing is to route Swift Road over the existing highway, which has been built to freeway standards to accommodate the heavy traffic at that location.

Contractor Lee Hoffman of Beaverton, Oreg., faced not only the necessity of maintaining traffic through his job, but unusually high construction standards as well. Some of the Class AA concrete called for a 28-day breaking strength of 5,000 psi, and the use of 8 sacks of cement to the cubic yard. Class A concrete called for a 6-sack mix, developing 3,300 pounds at 28 days. Class AA concrete in the 5,000-pound range was called for in the prestressed span.

The prestressing cables, each of which contains 12 wires having an end area of 0.0491 square inch each, carry the prestressing load over a 57-foot 10-inch span. Individual prestressing wires have high-tensile breaking strength properties of 220,000 psi. Prestressing was done in two pulls, with the first developing 0.6 of the ultimate load.

The structure's box-girder span measures 82 feet 5 inches, while the four regular reinforced-concrete girder spans measure 42 feet 4 inches, 54 feet, 54 feet, and 45 feet 5 inches. Seven bents and piers support the structure.

Difficult pile-driving

Probably the most difficult operation on the project was the pile-driving, chiefly because traffic constantly passed on both sides of the pile-driving equipment. Hoffman's special pile-driving rig was rented from Consolidated Freightways, Inc., Portland. The rig had a 70-foot boom, an H-beam set of leads, and a Vulcan No. 1 hammer which developed 15,000 foot-pounds of energy per blow. Two compressors—a Gardner-Denver 500 and a Gardner-Denver 365—supplied air to power the hammer. The 153

Turnpike tests Transmissions

Contractor D. W. Winkleman is building two stretches of the Ohio Turnpike . . . working in rough, wet cuts, his ten Model C Tournapulls are doing a major share of the 7,300,000 cubic yard excavating job. On this operation the distance from cut to fill is over a mile and a half . . . the Tournapulls make the round trip of over 3 miles in just under 22 minutes. Fuller Model 5-A-1120 Heavy-Duty transmissions *are putting every "Horse" of the 186 hp diesels into the job.* In this contest of "scrape . . . load . . . haul . . . return" Fuller 5-A-1120 transmissions gear the Tournapulls with the *right ratio* for each load and grade condition.

The performance of Fuller geared equipment working in every major industry in *all types of on- and off-highway service* has been so outstanding that leading truck and equipment manufacturers *standardize on Fuller transmissions* in their vehicles.

From more than 110 different models available for rubber-tired equipment from 100 to 400 hp; engines from 330 to 1440 cubic inches . . . there is a transmission *designed with your job in mind.* Specify a Fuller transmission for your equipment.

really where horsepower goes to work

Fuller TRANSMISSIONS

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wisc. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Western Dist. Branch (Sales & Service, All Products), 641 E. 10th St., Oakland 6, Cal.

Design of 336-foot structure calls for three types of span; traffic continues uninterrupted as work goes on overhead

Shop-built plywood forms are secured in place by Burke patented form clamps and steel ties. This prestressed deck slab will have no supporting columns. *Ray Day Photo*

piles in the job included untreated wood units from 55 to 60 feet long, and treated wood units from 30 to 35 feet in length.

Pile-driving conditions varied between one end of the 336-foot bridge and the other. On the east end of the structure, even the 55 to 60-foot untreated piles went in easily and no jetting was required. On the west end, however, an extremely tough driving formation made it necessary to bring in a Gorman-Rupp 3-inch jet pump, developing 150 pounds of pressure at the discharge nozzle. This pump was used throughout the entire west half of the structure to jet in the necessary holes so the piles would drive easier. In some of the harder jetting, production went down as low as five piles per shift. Approximately ten of the longest piles were ordinarily handled in 8 hours on the end where driving was easiest.

Modern concreting methods

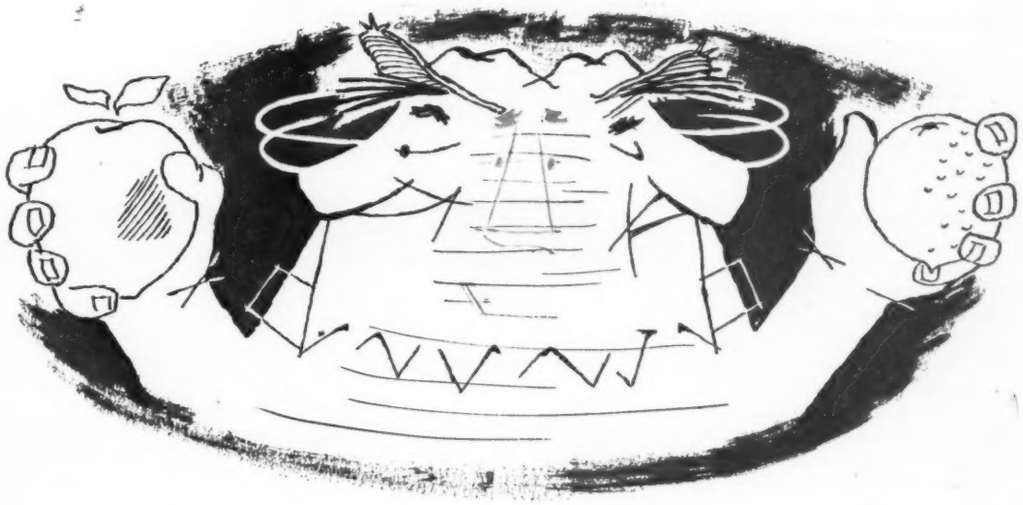
Modern concrete-forming and placing methods helped contractor Hoffman to reduce costs and speed the project to its July 31 completion date. For example, no gamble was made with traffic accidents under the structure due to narrow-clearance underpinning. Instead, Hoffman purchased and brought in heavy steel H-beams 24 inches in depth and ranging from 105 to 110 pounds per linear foot, each unit capable of spanning about 37 feet. The bridge spans were thus carried in the clear on these steel units, using 6×6 and 10×10 Douglas fir timber shores only under the very ends of the steel. This gave passing automobile traffic ample clearance to drive safely through the job.

With several skews called for in the structure, scarcely any of the form work was typical. Hoffman built all the concrete forms to proper dimensions in a central carpenter shop where DeWalt power equipment was centered. The forms were hoisted into place by a Bucyrus-Erie 22-B crane, and secured in place by the use of Burke patented form clamps and steel ties. Plywood facing was used on every exposed face so that architectural effects could be developed in the finished concrete—after the forms were stripped—with a minimum of hand work.

Ross Island Sand & Gravel Co., a commercial supplier at Portland, delivered concrete in a fleet of Rex truck mixers. On the footing pours, these mixers discharged the material direct. On columns, the material was hoisted into place by the Bucyrus-Erie crane and a Gar-Bro one-yard accordion-type bucket, which permitted the accurate placement of fresh concrete without regard to location or restricted clearances. Hoffman also found that the most efficient way of handling deck concrete was to haul the material in by truck mixers,

(Concluded on next page)

YOU CAN'T REPLACE A PEACH WITH A LEMON!



says HY WHEELER, the sage of the socket wrench!

Of course, I don't claim *nobody* else makes good bearings—but you're *never in doubt* when you replace a Hyatt with another Hyatt!

Sure, you may save a little dough on "bargain" offbeat bearings—but take it from an oldtimer, *it don't pay in the long run!* Chances are you'll end up havin' to do the whole job over again before long, and with somebody sore at you, too! I figger it's a lot smarter to play safe and *hold out for Hyatts in the blue and yellow box.* When it comes to *quality,*

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there's no substitute for . . .

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STRAIGHT BARREL TAPER

ROLLER BEARINGS

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

A GENERAL MOTORS PRODUCT GM A UNITED MOTORS LINE

(*Continued from preceding page*)

ramp up and dump these units by gravity into a Gar-Bro transfer hopper, and then use four Gar-Bro power buggies to haul the material over runways to the points of placement. One Maginniss vibrator and three Homelite high-cycle vibrators, powered by Homelite generating equipment, were used for the consolidation of this material. All concrete curing on the job was done by wet Sisalkraft paper or by water sprays operating continuously.

Supervising the job was E. W. Lindstrom, of the Hoffman organization, who worked in close cooperation with resident engineer John Petty of the Oregon State Highway Commission. The furnishing and installation of reinforcing steel, as well as the actual prestressing job on the special span, was done by Mercer Steel Co., Inc., Portland. THE END

Proceedings of course on roadside development

Proceedings of a four-day course in methods and practices of roadside development held last fall at Ohio State University are contained in a booklet published by the two sponsoring groups. The course was under the joint auspices of the university's School of Architecture and Landscape Architecture and the Ohio Department of Highways.

"Thirteenth Short Course on Roadside Development" contains, besides the lectures given during the session, photographs, maps, drawings, and the registration list for the course. Topics discussed—including tailored trees, maintenance, cutting for views along highways, weed-control programs, fertilizers and their application, and water conservation and erosion control—are listed together with lecturers in the table of contents.

The annual Short Course on Roadside Development was instituted in 1941 by the two sponsoring bodies. Last year, interested persons from 20 states attended the sessions.

Copies of "Thirteenth Short Course on Roadside Development" may be obtained by writing either Wilbur J. Garmhausen, Chief Landscape Architect, Ohio Department of Highways, Columbus 15, Ohio, or to Prof. Charles R. Sutton, School of Architecture and Landscape Architecture, The Ohio State University, Columbus 10, Ohio.

Specialized lubricants for construction machines

■ A booklet listing the characteristics of a diverse line of lubricants is available from Lubriplate Division, Fiske Bros. Refining Co., 129 Lockwood St., Newark 5, N. J. The literature lists the principal uses for a variety of oil and grease-type Lubriplate lubricants.

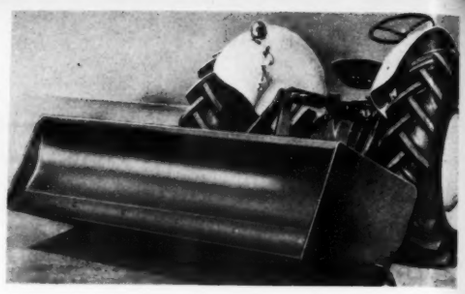
Recommendations are made for the lubrication of construction machinery, cement and quarry plants, trucks and tractors, compressors, etc.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 447.

Drag scraper features power angling and tilting

■ A tractor-mounted drag scraper designed for the new Ford 600, 800, and NAA series tractors, has been announced by Leland T. McGee Mfg. Co., Inc., 410 Dixon Ave., Compton, Calif. The hydraulically-controlled Model N, described as five implements in one, can be used as a scraper, scarifier, scarifier and scraper combination, floater and finisher, and backfiller. Because the new scraper can be angled or tilted through hydraulic power, it can do grading accurately with the tractor moving either forward or backward.

A feature of the new scraper is a live rocking action made possible through a top power link which replaces the tractor's top link. Controlled by the new McGee Gold Seal valve, this top power link will work on any three-point tool designed for the new Ford tractors. It is instantly adjusted from 19½ to 28½ inches by fingertip control.



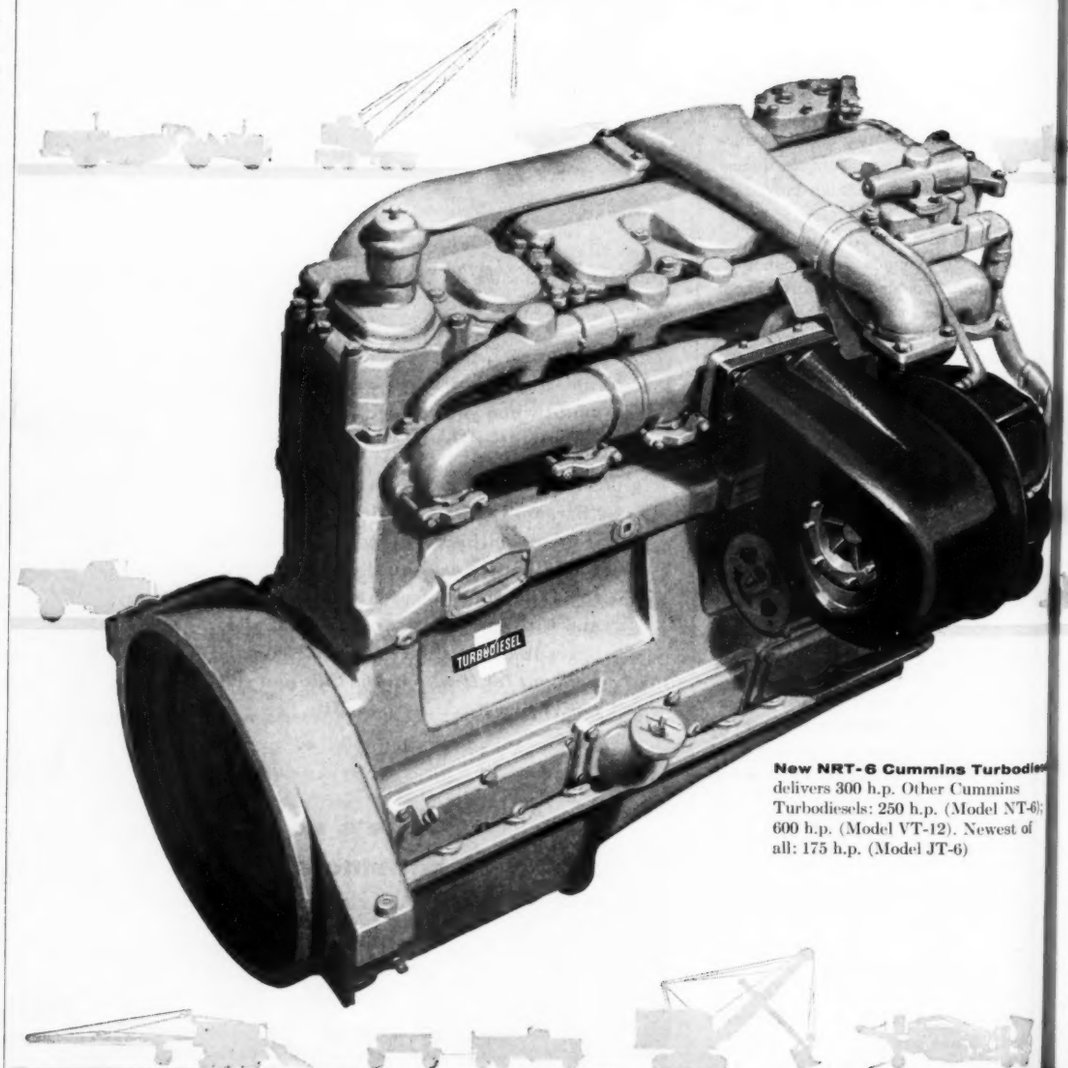
This new McGee tractor attachment will serve as a drag scraper, scarifier, backfiller, and finisher.

The scraper is 66 inches wide. Bowl ends are 36 inches wide × 20 inches high.

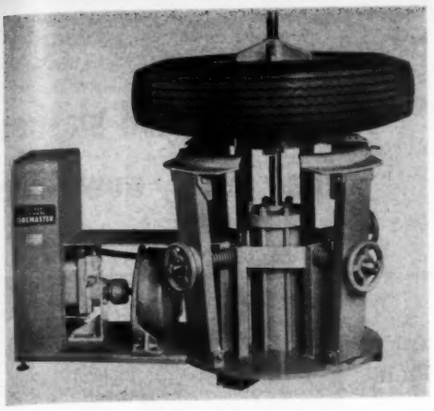
For further information write to the company, or use the Request Card at page 18. Circle No. 541.

Now available for all kinds of construction equipment...

NEW CUMMINS



New NRT-6 Cummins Turbodies
delivers 300 h.p. Other Cummins Turbodiesels: 250 h.p. (Model NT-6); 600 h.p. (Model VT-12). Newest of all: 175 h.p. (Model JT-6)



The hydraulic Tiremaster removes big tires from their rims in a matter of minutes.

Hydraulic equipment pries big tires from rims

■ Hydraulically operated equipment for removing large tires from their rims is available from Salsbury Corp., 1161 E. Florence, Los Angeles 1, Calif. Using up to 33 tons of hydraulic pressure, the electrically controlled Tiremaster is reported to dismount the most tightly frozen tire quickly.

The tire changer handles any tire 15 to 24 inches in rim diameter that is mounted on any flat-base-type wheel up to 12 inches wide. Models for wider-base rims in larger or smaller tire sizes are available on special order.

Operation of the hydraulic equipment is simple. The operator positions the wheel, rim, tire, and tube on a center shaft, where it rests on four rim-support blocks. He then adjusts four contoured bead-breaking shoes to the exact rim size and starts the motor.

As the rim moves downward with the wheel and tire, the bead-breaking shoes are forced between the rim and the bead of the tire to dismount the tire.

For further information write to the company, or use the Request Card at page 18. Circle No. 542.

Booklet on combination tractor-compressor unit

■ A bulletin describing Le Roi's new 125 Tractair, a tractor-air compressor unit, is available on request.

Featured in the literature is the power unit of the Tractair, a Le Roi D226 engine, which is joined in the same block with a two-cylinder air compressor. Illustrations show engine design, compressor features, and operating conveniences. Specifications of the compressor and engine, as well as standard equipment and attachments, are listed on the back cover.

Twenty-one typical uses of the Tractair are listed. Applications include driving form pins, drilling holes in quarry, lifting in a yard, towing equipment, breaking concrete, loading trucks, digging trenches, and backfilling a trench.

Included among 21 attachments and tools listed are: breaker, sinker, Mobildrill, tamper, front-end loader, utility boom, winch, wood saw, earth auger, and rotary sweeper.

To obtain this literature write to Le Roi Division, Westinghouse Air Brake Co., 1706 S. 68th St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 465.

Device dials saw settings for cutting roof rafters

■ A handy dial-type meter that explains the operations involved in cutting the common rafter, and that can be used to predetermine the angles for level and plumb cut without employing a carpenter's square is available from DeWalt Inc., Lancaster, Pa. The concern has prepared the device in response to an increasing number of requests for information on the various settings of a radial saw required in the preparation of roof rafters. Although designed primarily for use with a DeWalt saw, the meter can be used with any radial or table-type saw.

To operate, the user simply dials the circular wheel to any one of 19 common roof pitches. Then, in a window cut-out, he reads the indicated miter settings for the desired level and plumb cuts, the length per foot of run, and the rise per foot of run for that particular pitch.

The rafter meter is now available at a nominal price from most DeWalt dealers.

For further information on how to obtain the meter, write to the company, or use the Request Card on page 18. Circle No. 427.

STURBODIESELS

POWER!.....PERFORMANCE!.....PROFIT!

Here's a new power concept to make *your* construction jobs more profitable. Cummins Turbocharging brings you extra diesel horsepower without added engine weight by harnessing the energy in normally wasted exhaust gases . . . boosting engine efficiency.

Field tests on all kinds of construction jobs show significant savings in time, fuel and equipment. And like all Cummins Diesels, the new Turbodiesels feature the simple to understand and service PT fuel system and easy-as-gasoline maintenance. Added time-saving economy feature for construction men: special service and parts availability on job sites is arranged by your local Cummins distributor to serve *your* needs.

No wonder *more and more construction men today are standardizing on Cummins Diesels.*

CUMMINS diesels give you the big plus **MORE PROFIT**

Cummins Engine Company, Inc.
Columbus, Indiana

I am interested in finding out more about the advantages of Cummins Turbodiesels. Please send me:

_____Your directory of manufacturers offering Cummins Diesels in their equipment.

_____Your booklet illustrating Turbodiesel principles.

I am interested in converting my present equipment to Turbodiesel power.

_____Please have your representative call.

Name_____

Position_____

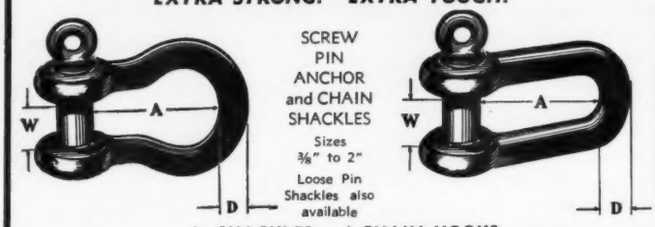
Company_____

City_____State_____

CE-8

BIG ORANGE *Hi-Strength* PRODUCTS

EXTRA STRONG! EXTRA TOUGH!



In SHACKLES and CHAIN HOOKS it is STRENGTH that Counts BIG ORANGE HAS IT!

Shackle Hooks Can Be Used on "HIGH TEST" Chain

Grab Hooks Available for Chain Sizes 1/4", 5/16", 3/8", 7/16", 1/2"

SLIP HOOKS for Chain Sizes 1/4", 5/16", 3/8"

Ask your Distributor or Write

MIDLAND INDUSTRIES, INC.

CEDAR RAPIDS, IOWA

TRENCHING ON THE TURNPIKES AND THE THRUWAYS

Herkner Construction Co.'s CLEVELAND *cuts underdrain trench adjacent to a catch basin at Route 21—Turnpike Interchange.*

One of four CLEVELANDS *owned by Harry Miller Excavating Co. digging trench for drain tile on approach to Route 8—Turnpike Interchange.* →

CLEVELANDS dig many miles of trenches required for Ohio's first Super Highway

If you were to travel along the Ohio Turnpike *now*, while it is under construction, you could not go many miles on any part of it without seeing a CLEVELAND trencher or backfiller at work. These highly efficient machines are digging and filling many miles of trenches required for the drainage of water from the turnpike itself, as well as its interchanges, its overpasses and underpasses, and the approaches to them . . . plus many more miles of trenches for the restoration of farm drainage systems along the right of way . . . for relocating gas, water and oil pipelines . . . and for installation of lighting cables, etc.

This widespread use of CLEVELANDS in the construction of the Ohio Turnpike parallels their extensive application in the building of such famous highways as the Pennsylvania and New Jersey Turnpikes, Oklahoma's Turner Turnpike and the New York Thruway. CLEVELANDS will continue to be important factors in the swift and economical completion of America's huge highway program for the future—the largest highway program undertaken in history.

Your local distributor will show you how Clevelands do more—for less

THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave., Cleveland 17, Ohio

CLEVELAND

Welding method slashes repair costs, downtime

Using only two pounds of Ni-Rod 55 nickel-form electrode to resurface worn conveyor-belt rollers, a Northport, Long Island, concrete - materials supplier saves 80 per cent of the cost of new rollers. Here a welder resurfaces a worn roller.

Contractors plagued by breakdowns in their heavy equipment fleets are learning that they can cut both maintenance costs and downtime by welding worn and broken cast-iron parts. Numerous applications of the welding principle have demonstrated that this method of repairing heavy machinery often eliminates the need for costly parts, to say nothing of reducing lost man-hours and machine-hours.

The following case histories illustrate some uses of this economical repair process. Some of these repairs were done at the site of the breakdown under difficult field conditions. In all cases, International Nickel Ni-Rod 55 welding electrodes (55 per cent nickel, 45 per cent iron) or Ni-Rod (pure nickel) electrodes—both developed especially for cast-iron welding—were used.

A Canadian contractor found welding the answer to a problem on an excavating job. A big cast-iron gear for an excavator had stripped all but two of its 76 teeth. The gear looked like a total loss, but the contractor needed the machine—and installing a new gear meant waiting three or four months for delivery.

After degreasing, cleaning, and grinding the gear, repairmen heated it to 600 degrees F. Welding with nickel electrodes was done continuously, with the gear being rotated a quarter turn between each pass. The teeth were built up 90 per cent with the nickel electrode, and the job was completed with hand-surfacing rod. The excavator was back on the job in less than two weeks.

In another case, a loose connecting rod hurtled out of the cylinder block on a tractor. The accident made a jig-saw puzzle of the section around the left-hand port, and cracked the rim of the right-hand port.

The contractor fitted the fragments into place and welded the section se-

Rolatape THE MODERN, MOBILE MEASURING INSTRUMENT

FOR LOW-COST, ACCURATE MEASURING

MODEL "400" This Model is a favorite and is widely used by Telephone Companies and other Utilities, paving contractors, land appraisers, etc. It's four-foot circumference measuring wheel makes it most suitable for measuring fairly rough terrain. Automatic measuring counter can be reset at any distance. Folds compactly.

MODEL "200" A popular Model for interior and exterior use. Tabulates wall-to-wall, vertical, or a 101 other measuring assignments. Folds compactly for kit or glove compartment.

MODEL "600" For cross country acreage measurement and work on rougher terrain.

NOTE—All Rolatape Models are designed to tabulate accurate measurements, and are constructed for long and dependable service. With Rolatape, you measure as you walk.

FOR COMPLETE ROLATAPE INFORMATION AND PRICES PLEASE WRITE

ROLATAPE, INC.
1741 14th Street, Santa Monica, Calif.
OR SEE YOUR LOCAL DEALER

curely with ⅛-inch-diameter nickel-alloy electrodes. The motor was still running a year later.

A concrete-materials supplier in Northport, Long Island, N. Y., uses seven long conveyor belts to move 7,000 cubic yards of sand daily from its pits to the screening house. And sand abrasion, not to mention corrosion from salt air, is continually wearing down the belt rollers.

A new roller costs $1.42, plus $10 in machining. But the supplier's welding specialists have found that by using two pounds of nickel-iron electrode they can resurface two rollers and turn them down on a lathe for a total cost of only $4.70. And the resurfaced rollers last as long as new ones. The firm estimates it uses about 200 pounds of electrodes a year, thus saving over $700 in replacement costs.

These are just a few isolated examples of the uses to which welding is being put by contractors and other users of heavy mobile equipment. The applications of this economical maintenance method are unnumbered, and in nearly every case there is a substantial saving over old repair methods or replacement of broken and worn parts.

THE END

Safety is no accident! The life you save may be your own.

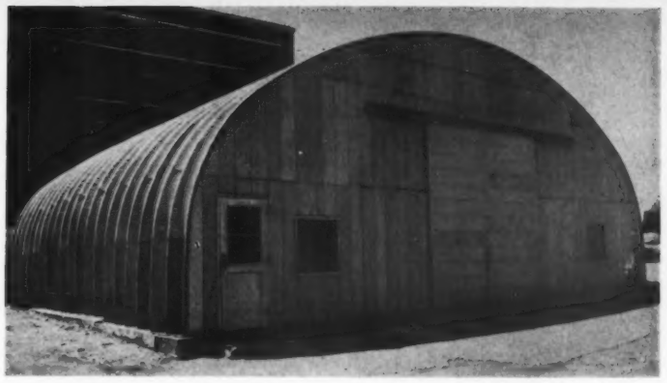
Prefabricated building has straight-wall design

■ Development of a new straight-wall prefabricated steel building, featuring trussless construction, has been announced by Wonder Building Corporation of America, 30 N. LaSalle St., Chicago 2, Ill. According to the manufacturer, the new structure is designed to meet all building-code requirements and will withstand wind velocities up to 125 miles per hour.

It is emphasized that the straight-wall design permits the use of mechanized material-handling procedures in warehouse storage. The walls of the steel building rise vertically to a height of 9 feet before curving to form a semicircular roof. Designed on the principle of the self-supporting arch, the building has an interior completely free from supports, pillars, beams, or posts.

The only components of the building are sections of 2-foot-wide galvanized corrugated steel and steel fasteners. Available sizes range in widths from 30 to 50 feet and from 12 to 18 feet in height. Structures of any length can be built by fastening additional steel sheets to an existing structure.

For further information write to the company, or use the Request Card at page 18. Circle No. 404.



◄ The new Wonder prefabricated steel building features a straight-wall design that provides extra interior space and also speeds erection on the job.

OUT ON A LIMB?
McKISSICK
Self Locking
SNATCH BLOCK
IS YOUR ANSWER
Heavy plate with pressed-in recess around sheave to prevent rope jamming.
Handy self-locking block — rope easily inserted. Shouldered center pin keeps plates from cramping or spreading.
All steel construction. Drop forged heat treated hooks, heads and links.
McKISSICK
McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

BITUMINOUS DISTRIBUTOR
Front or rear mounted for truck or trailer . . . with pressure metering.
MAINTENANCE UNIT
Heating and spraying unit . . . 2-wheel or truck mounted.
SUPPLY TANK
Truck or semi-trailer mounted . . . single or tandem axle.
ROSCO-FACTOR
9 or 13 wheel roller . . . 90 to 125 cubic foot capacity.
a partial showing of the complete
ROSCO LINE
of construction and maintenance equipment for
● HIGHWAYS
● STREETS
● AIRPORTS
Send for "Complete Line" bulletin 54-4.
ASPHALT KETTLE
2-wheel pneumatic mounted . . . hand or power spray.
ROAD SWEEPER
Two way . . . power driven . . . full 4-wheel trailer mounted.
STREET FLUSHER
Truck mounted as shown or 2-wheel model for towing.
STREET CLEANER
Model MBC
Power driven . . . for sweeping or flushing . . . wet or dry. Send for "Complete Line" bulletin 54-4.
ROSCO
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DISTRIBUTORS
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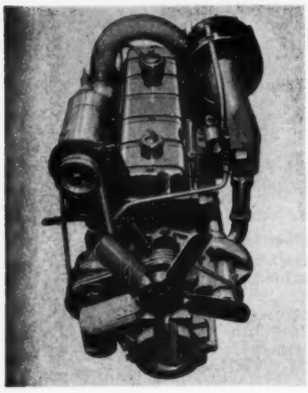
ROSCO MFG. CO. • 3118 Snelling Avenue • Minneapolis, Minn.

175-hp turbodiesel engine features light weight, fuel economy, and efficiency



Cummin's new JT-6 turbodiesel engine is expected to find wide use in medium-heavy-duty trucks. The 175-hp diesel power unit is comparable in weight to gasoline engines of equal power and offers an advantage in fuel economy.

■ A lightweight 175-hp turbodiesel engine has been announced by Cummins Engine Co., Inc., Columbus, Ind. Designated the JT-6, this engine weighs 800 pounds less than other Cummins diesels of equivalent horsepower, and is comparable in weight to gasoline engines of similar power. The new Cummins turbodiesel is a six-cylinder in-line model with 4⅛-inch bore, 5-inch stroke, and displacement of 401 cubic inches.

Because of its light weight and high horsepower rating, the JT-6 is expected to find wide application in vehicles in the 19,500 to 26,000-pound gvw class. It is estimated that at present only about 10 per cent of trucks in this weight class are diesel-equipped. Installed in a truck, the JT-6 engine weighs only 1,615 pounds or 9.2 pounds per horsepower.

With lower hourly operating costs than gasoline engines, the JT-6 is also expected to make diesel power economically feasible for a larger number of construction and quarrying machines than heretofore.

The key to the high horsepower available from this small engine is turbocharging, which utilizes the normally wasted energy of the exhaust gas to create added power. This is accomplished by piping the exhaust through a turbine, which is one element of the turbocharger, causing the turbine wheel to rotate at high speed.

A centrifugal impeller, mounted on the same shaft, draws fresh air and blows it into the intake manifold and cylinders under pressure. This tends to result in more complete fuel combustion, so that the JT-6 develops 40 per cent more power than a comparable naturally-aspirated model.

Improved performance is due, also, to the engine's new four-valve cylinder head with two intake and two exhaust valves. The combination of turbocharging and the improved breathing characteristics of the new cylinder head allows the JT-6 to develop 175 horsepower with the same quantity of fuel as the mechanically supercharged 2-valve-head Cummins Model JS-600 uses at 150 horsepower.

Cummins' simplified PT fuel system is found on the new JT-6 Turbodiesel. This system is a continuous-flow type that has no fuel racks or plunger pumps to adjust. Check valves, injector valves, and float valves are completely eliminated, and a simple flyball-type governor controls idling speed and limits maximum speed.

For further information write to the company, or use the Request Card at page 18. Circle No. 448.

	JN-6*	JS-600**	JNS-6***	JT-6****
Flywheel horsepower	125	150	165	175
Governed speed (rpm)	2,500	2,500	2,500	2,500
Displacement (cubic inch)	401	401	401	401
Horsepower per cubic inch	.312	.373	.412	.435
Lbs. per horsepower	11.6	10.3	9.4	9.2
Fuel consumption (at max. hp.)				
gallons per hour	7.6	10.6	10.6	10.6
Lbs. per bhp hour	.440	.515	.466	.440

This table compares horsepower, weight, and efficiency of the JT-6 turbodiesel engine with naturally-aspirated and mechanically supercharged engines of the J series.

* Naturally Aspirated 4-Valve Head
** Supercharged 2-Valve Head
*** Supercharged 4-Valve Head
**** Turbodiesel 4-Valve Head

GAR WOOD
Presents
'EQUIPMENT THAT SUITS THE JOB'

. . . The Gar Wood '75' line of ¾ yard excavators, in both standard and heavy-duty models and 20-ton truck crane, have ably and economically handled a wide variety of jobs. Check the many Gar Wood advantages before placing *any* order!

Quarry work...

Gar Wood's independent travel while swinging permits faster moves away from rock slides to increase safety factor. Drop ball can operate from second drum without hooking to bucket teeth. Less wear and tear because fluid coupling operates to meet varied rock conditions.

Sand and Gravel...

Full dippers and fast loading pay off on sand and gravel work. Gar Wood's positive independent chain crowd gets full engine power into the load — dipper retracts at twice the crowd speed. Power actuated drum clutches cut operator fatigue — get more tons loaded per day.

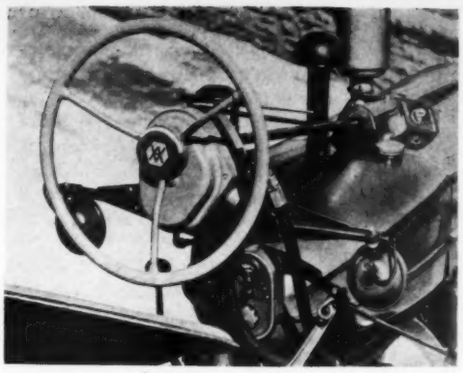
Concrete work...

Concrete work requires the same smooth, precision operation necessary on steel erection and a Gar Wood '75' can position buckets to perfection. The 75BT, heavy-duty truck crane, is extremely mobile — both on the job and on moves from job to job—saves time, cuts costs!

Power-steering device is easily installed on present equipment

■ A new power-steering device that can be installed in 2 or 3 hours on virtually any vehicle without structural changes in the equipment has been announced by Westinghouse Air Brake Co., 3 Gateway Center, Pittsburgh, Pa.

Designed for easy installation on tractors, loaders, graders, lift trucks, and other construction machinery already in the field, the device is also expected to be used as original equipment on new vehicles. It is reportedly the only unit of its kind that can be installed without retooling the manufacturing line.



This new Westinghouse power-steering device, easily installed on a wide variety of mobile construction machinery, has a top power limit to prevent damage to the existing steering mechanism. Also, it can be installed without structural changes in the equipment.

Designed to permit full-power 360-degree steering, the Westinghouse power-steering unit contains a top power limit to prevent possible damage to existing steering mechanisms. This is one of the features that make it so readily adaptable to present equipment.

The unit gets its power from a small hydraulic pump which can be attached either to the generator or to the distributor. There are no delicate adjustments to be made and all moving parts of the unit are completely enclosed and sealed against damage from dirt or the elements.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 506.

Chemical grouting system solves seepage problems

■ A new method of chemical grouting has been developed by Chemject Corp., 3521 N. Cicero Ave., Chicago 41, Ill. The Chemject method is reported to be effective in preventing seepage of ground water into tunnels, shafts, mines, basements, and pits. It is based on the use of an acrylic monomer, CJ-1, in aqueous solutions applied by injection techniques.

This chemical imparts cohesion to sand and gravel and renders soils impervious. When injected under controlled conditions, the chemical polymerizes within the sand voids, producing a compressive strength of approximately 20 psi. The reduction in permeability prevents the flow of ground water, and the increase in strength makes excavation easier.

Firms interested in applying the process as licensees are invited to contact the Chemject Corp.

For further information write to the company, or use the Request Card at page 18. Circle No. 436.

Concrete equipment for hoisting tower

■ A concrete hopper, concrete bucket, mortar jigs, and mortar-board stands are being offered by Bil-Jax, Inc., Archbold, Ohio, for use in conjunction with the firm's material-hoisting tower.

The concrete hopper, which clamps to the tower, has a 16-cubic-foot capacity. The bucket's capacity is 14 cubic feet. The self-dumping-type bucket can be interchanged with the regular hoist-tower platform. The mortar jigs are for use on glass-block masonry, and the mortar-board stands, of tubular steel, are available in two types.

For further information, write to the company, or use the Request Card at page 18. Circle No. 494.

This 16-cubic foot concrete hopper is one of the pieces of equipment offered by Bil-Jax, Inc., for use with its material hoisting towers.

Steel Erection...

Boom lengths up to 80′, with tip extension if required. Optional fluid coupling, power operated drum clutches and direct drive with optional power load lowering, combine to permit smooth, precision work. Truck crane has folding boom for quick, easy moves in traffic.

Drainage Canals...

Faster swings, smoother operation, *plus* self-cleaning crawlers for marshy terrain, add up to more work daily when used as dragline or clam. Low-mount, back-hitch gantry offers all the advantages of high gantry when long crane booms are needed for extra long reach.

ASK FOR A DEMONSTRATION

GarWood

SHOVELS·CRANES TRENCH HOES

Foundation Borer...

Only Gar Wood offers this new, profit making tool! Combines boring and belling into one streamlined operation for low cost construction of unreinforced foundation footings, caissons, piers, piles, wells, wall supports, etc. Factory installed to order. Completely convertible.

... Distributors throughout the country will gladly show you how Gar Wood performance puts profits in your pocket!

GAR WOOD INDUSTRIES, INC.

WAYNE, MICHIGAN

No. 551

THIS REAR-END LOADER, a new entry in the field, is designed for use on Fordson Major diesel tractors. Capacity of the bucket is 1 yard. The manufacturer emphasizes the attachment's rugged construction and the fact that it is designed to take advantage of the economy of a diesel-powered tractor. For further information write to Northeast Implement, Inc., Box 904, Worcester, Mass., or use the Request Card at page 18. Circle No. 543.

Oil clutch adapted to motor grader

■ The oil clutch that has proved successful in Caterpillar track-type tractors is now being introduced in the No. 12 motor grader as standard equipment. Caterpillar Tractor Co., Peoria, Ill., announces it will begin immediate production of the improved machine, and will offer it at no additional cost.

The oil clutch in the No. 12 motor grader works as follows: a separate pump, incorporated with the engine oil pump, supplies crankcase oil to the clutch. When the clutch is disengaged, oil surrounds the clutch disks, cooling the facings. The two driven disks on the No. 12 have special resilient organic-material facings bonded to them in which there are a network of grooves to permit the oil to escape during engagement.

The free circulating oil quickly dissipates the friction heat and also acts as a lubricant for all moving parts, including the pilot and throw-out bearings. Once the clutch has been engaged, the friction surfaces are rendered completely free of oil because of the pressure between the plates.

Field tests reported show that the clutch facings undergo very little wear, averaging only 0.0025 inch in 1,000 hours of operation.

The oil clutch will give the No. 12 motor grader the advantage of reduced clutch-pedal effort, since the internal mechanism is operating in oil. After the initial break-in period, the No. 12 is expected to operate a long period of time without clutch adjustment.

For further information write to the company, or use the Request Card at page 18. Circle No. 441.

One-bag cement mixer is tractor-mounted

■ A tractor-mounted cement mixer is shown in a folder from Universal Pulleys Co., Inc., 330 N. Mosley, Wichita, Kans. The Transmix unit has a one-bag capacity at 5 to 1, and will mix, transport, and dump 5 cubic feet of material over rough ground in road gear, with the mixing barrel stationary or turning.

Driven from the tractor power take-off, the mixer dumps hydraulically. It can be mounted on Ford & Ferguson, Ford 600 and 800, Oliver 55, IHC Super C, IHC H&M, Case VAC, Allis-Chalmers WD, and John Deere 40 tractors.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 437.

20 out of 22 crawlers drive through torque converters

. . . and they're all Twin Disc!

Of the 22 crawler tractors working on the first section of the Indiana Toll Road now under construction—*20 are equipped with Twin Disc Torque Converter Drive!*

Why this top-heavy proportion of Torque Converter crawlers? Let's ask H. T. Lattimore, general superintendent for Suber & Co., of Whitmire, S. C., the contractor with the earth-moving contract for the first 12-mile stretch.

"We prefer Torque Converter crawlers," says Mr. Lattimore, "because they give us more usable power, and more power *means more work done every day.* The Torque Converters cut out engine lugging, cut down on shifting and clutching and make it a lot easier for our operators to match tractor power to the load. Operators move more dirt and are less tired after a full day's work on a tractor with Torque Converter Drive."

Throughout the construction industry, more and more contractors are carefully checking the performance of Torque Converter-equipped tractors . . . and arriving at the same conclusions! That's why *all three* of the "Big 3"—Allis-Chalmers, Caterpillar and International, manufacturers of the most powerful crawler tractors now available—have standardized on Twin Disc for their Torque Converter Drive models!

Be sure there is a Torque Converter Drive in the next tractor you order. Check with your dealer today for complete information on Torque Converter Drive — and the tremendous increase in *drawbar pull* it will give your tractors.

Photo — Excavating on the Indiana Toll Road, Suber & Co. is working ten HD-20, six new HD-21, one HD-15AC Allis-Chalmers and three TD-24TC International crawlers—a total of 20 out of their 22 tractors on the job *driving through Twin Disc Torque Converters!*

TWIN DISC

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydralic Division) Rockford, Illinois

LOWER COST

WINDROW LOADING
New claw-feeder principle

with the NEW Barber-Greene
WINDROW LOADER
easy maneuverability
with an 8'-6" turning radius
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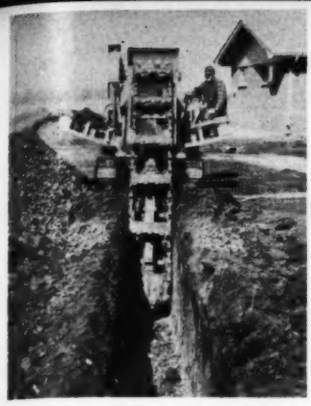
see your B-G distributor or write
Barber-Greene
AURORA, ILLINOIS, U.S.A.



Compact design and low ground-bearing pressure are two features of the new Model 155 Trenchliner.

Trencher designed to work in congested areas

■ A new ladder-type trenching machine has been developed by the Parsons Co., Newton, Iowa. The latest Trenchliner has smaller over-all dimensions, reduced weight, a low center of gravity, and low ground-bearing pressure. The new Model 155 was designed to work in congested areas normally inaccessible to a trencher of its capacity.

The machine produces from 5.8 inches to 12.75 linear feet of trench per minute in a range of 30 speed selections made by lever control. Thirty higher speeds, up to 25 linear feet per minute, are available through a simple sprocket change. With a maximum depth capacity of 8 feet and digging widths from 16 through 26 inches, the Model 155 is designed for a wide work range including trenching for sewer, water, and gas lines, as well as general construction work.

Other features include a hydraulically actuated boom hoist with positive down-crowd, power-shifted reversible belt conveyor that discharges spoil to either side and at selective distances from the trench wall, and friction-type clutch for the bucket-line drive.

There is a choice of 16, 20, or 24-inch buckets to which oversize adaptors can be fitted to increase trench widths by 2 or 4 inches. The machine uses Parsons' reversible and self-sharpening tap-in bucket teeth.

For further information write to the company, or use the Request Card at page 18. Circle No. 526.

Track-mounted compressor equipped with attachments

■ A self-propelled crawler-mounted air compressor that will travel over any type of ground and through mud and snow is shown in literature from Schramm, Inc., West Chester, Pa.

The Schramm Model 60 is a gasoline-engine-driven compressor that can be equipped with a hydraulic frame on which is mounted a 48-inch backfill blade or a ¼-yard bucket.

The compressor furnishes ample air for the operation of paving breakers, rock drills, backfill tampers, spades, and other pneumatic tools.

To obtain Bulletin FCB-54 write to the company, or use the Request Card at page 18. Circle No. 527.

Abrasive blades designed to cut green concrete

■ A new series of reinforced abrasive blades for cutting contraction joints in green concrete has been marketed by the Clipper Mfg. Co., Suite 635, 2800 Warwick, Kansas City 8, Mo.

The GreenCon blades are available in a series of specifications for cutting a wide range of hard to soft limestone aggregates, as well as coral and steel-mill slag. The blade will also cut these aggregates with small percentages of granite or crushed river gravel.

Doubly reinforced through the center, the new Clipper blades are also reinforced around the hub on both sides. The blades are available in standard 14-inch diameters for cutting ¼-inch-wide joints.

For further information write to the company, or use the Request Card at page 18. Circle No. 406.

Straddle carrier equipped to haul and dump loads

■ Performance characteristics, construction details, and specifications of its new straddle dump carrier are contained in a brochure available from Clark Equipment Co., Ross Carrier Division, Benton Harbor, Mich.

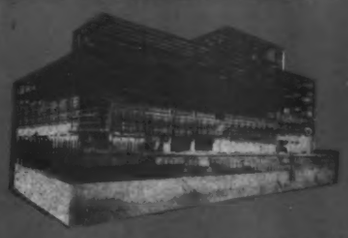
The hydraulically operated dumping device used with the 20,000-pound capacity straddle carrier is described. Through its use box-like containers for gravel, scrap, coal, sand, and other bulk materials can be picked up, transported any distance, required, and dumped in a one-man operation.

Container specifications are given in the brochure so that users may build them locally. Container capacities range from 7 to 20 cubic yards.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 432.

big savings of time and money!

on another job with Whiteman equipment



May Co. Department Store, Hawk Hollywood, California. Albert C. Martin, Architect; T-S Construction Engineers, Inc., General Contractors.

At least 20 hand buggies and 20 men would be required to haul and pour the concrete being handled by 4 Whiteman Power Buggies on the May Co. job. They're gluttons for work. Never get tired or slow down.

T-S CONSTRUCTION ENGINEERS, INC.
800 ST. PAUL AVENUE
LOS ANGELES 17, CALIFORNIA
MADISON 9-1121

PAUL B. TICHENOR, PRESIDENT
MERLE F. SMITH, VICE PRES. & TREASURER
PETER STERLING, SECRETARY

February 14, 1955

Whiteman Manufacturing Company
3249 Casitas Avenue
Los Angeles 39, California

Gentlemen:

You will be interested in knowing how Whiteman Power Buggies have speeded up the May Company job and effected a very substantial saving in labor costs.

We have handled as much as 375 yards in 5 hours with 4 Buggies, on upper floors, with hauls averaging 225 feet. We don't know what we would have done without them.

Yours very truly,

T-S Construction Engineers, Inc.

Paul B. Tichenor

Paul B. Tichenor
President

WHITEMAN VIBRATORS are efficient, rugged, dependable. Three models, gas and electric, are "tailored to the job." Complete line of vibrator accessories.

WHITEMAN SCREEDING MACHINES do a better job in far less time. Screed to a perfect level. Save labor. Easily portable. Width adjustable from 3 ft. to 20 ft.

WHITEMAN FLOATING-FINISHING MACHINES produce a smooth, perfect slab. Job-proven for 17 years. Four models — one for any job requirement.

Whiteman

THE LEADER IN CONCRETE EQUIPMENT

SEND NOW!

Whiteman Manufacturing Co.
3249 Casitas Ave., Dept. CE
Los Angeles 39, Calif.

Please send prices, literature and name of distributor for ☐ Vibrators, ☐ Screeding Machines, ☐ Power Buggies, ☐ Floating-Finishing Machines.

Name _____
Firm _____
Address _____
City _____ Zone ____ State ____

Looking up 86 feet at the massive rigid steel frames that support the roof of the 246 × 345-foot auditorium. *C&E Staff Photos*

Rigid steel arch frames carry auditorium roof

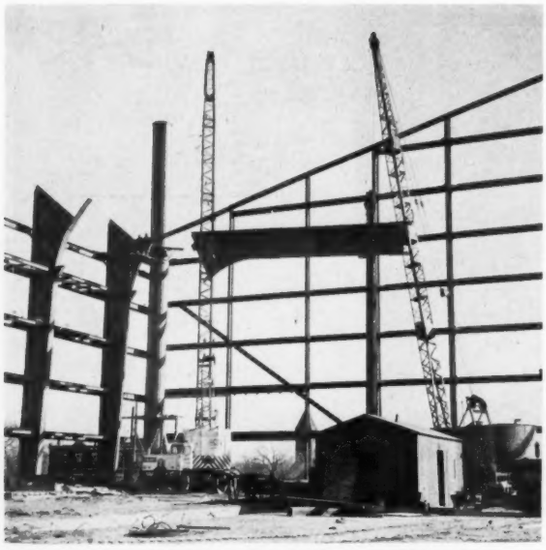
Three cranes operate from arena floor to set 95-ton bents in six sections; members span 246-foot-wide interior

Three cranes combined their lifting capacities to erect the big rigid frames which support the roof of the new Veterans Memorial Auditorium in Des Moines, Iowa. And this was no routine erection stunt, for the steel frames span the width of the building to provide an unobstructed interior 246 feet wide, 345 feet long, and 86 feet high at the center.

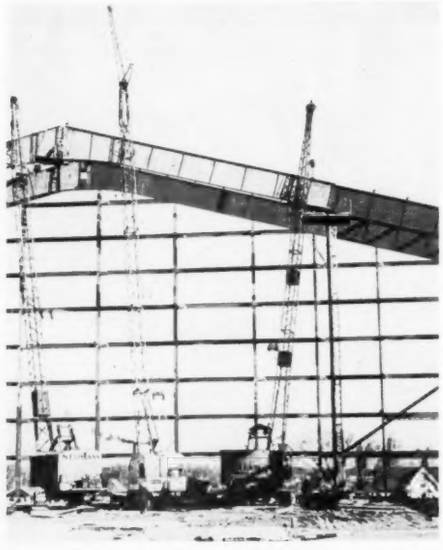
The auditorium, built for the City of Des Moines, occupies a 10-acre site on a hill just north of the business district of the city. Excavation and site grading were begun in December, 1952, and the structure was completed early this year.

All practicing architects of the city united under the name of Des Moines Architects Commission to plan and design the structure. The firm of Tinsley, Higgins, Lighter & Lyon was named chief architect. The general contract in the amount of $3,177,900 was awarded to Arthur H. Neumann & Bros., Inc., Des Moines.

Separate contracts were awarded for the following items: ventilating, to Backman Sheet Metal Works, Inc.; plumbing and heating, to A. J. Allen Plumbing & Heating Co.; electric wiring, to Johnson Electric Co., Inc.; and ice rink, to York Products, Inc. All are Des Moines contractors. A bond issue of $5,250,000 was floated to cover the cost of the structure and equipment, together with land, architect's and legal fees, and other items.



The first roof section of one of the arch frames is lifted into place by a Link-Belt crane, at left, and a Koehring crawler rig.



Three cranes—a P&H, a Link-Belt, and a Koehring join forces to set the final section of an arch frame.

Erecting roof frames

Probably the most spectacular part of the work was the erection of the steel roof frames. These frames are supported on concrete footings at the basement level and project upward through openings in the first floor, which is the main arena floor. The

Materials are hoisted up through the roof members by a Michigan truck crane with 80-foot boom and 10-foot jib.

A Koehring 601 crane sets steel for the entrance section of the new Veterans Memorial Auditorium in Des Moines, Iowa. This view shows the 12 rigid bents which support the roof of the structure.

Concrete for the balcony forms is discharged from a 1-yard bucket handled by a crane on the floor slab. A Mall vibrator works the mix into the forms. *C&E Staff Photo*

horizontal thrust of the frames at the footings is resisted by tie rods, 2⅝ inches in diameter by 240 feet long, which tie the vertical legs together just below the basement floor level. The vertical legs, 84 feet high and weighing more than 45,000 pounds each, were placed after the main arena floor had been poured and wedged securely in the floor openings.

When the vertical legs had all been erected, three cranes were moved in on the main arena floor to erect the other four sections of each of the 12 frames. This floor was designed for a live load of 400 pounds per square foot—strength sufficient to support the heavy cranes as they placed the steel. The contractor used two of his own cranes, a P&H 700 and a Koehring 601, both of which were crawler-mounted. The third crane was a Link-Belt Speeder rubber-tire-mounted rig rented from J. C. White Concrete Co., Des Moines.

Frame sections were fabricated at the Pittsburgh-Des Moines Steel Co. plant in Des Moines and hauled to the job on truck-trailers. In addition to its vertical legs, a frame has four sections, each of which represents approximately one-fourth of the span. The two outer sections which attach to the legs weigh just under 14 tons each, and the interior sections weigh approximately 11 tons each.

In erecting the frames, two of the cranes first raised one of the outer sections and held it while temporary connections were made to the vertical leg and a falsework tower placed under the free end. The outer section on the opposite side was next raised and positioned in the same manner. Two of the cranes then raised one of the interior sections and held it while workmen placed bolts to connect this piece with the outer piece already in place. Then, while one crane continued to hold the free end of this section, the other two rigs placed the other interior section to complete the closure. The falsework bents were then removed and the entire process was repeated for the next frame.

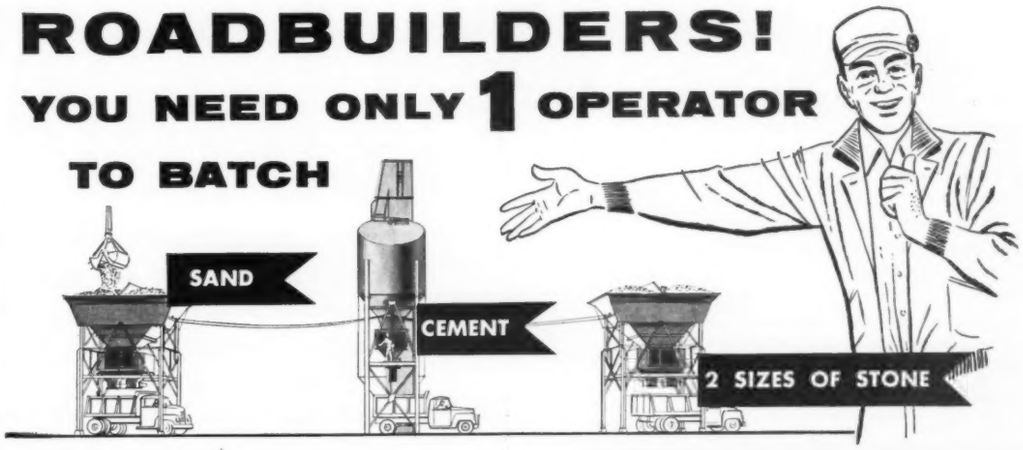
Riveting crews completed the splices and added the purlins and bracing. Air for riveting and other uses was supplied by a Gardner-Denver 500-cfm compressor powered by a Caterpillar diesel engine. This compressor was housed in a shed located near the middle of the arena floor. Lighter pieces of roof steel were hoisted into place by a Michigan truck crane equipped with an 80-foot boom and a 10-foot jib. Subpurlins span between the purlins to support the roof deck, which consists of one inch of insulation and a 2-inch poured gypsum slab. A built-up roof covers this slab. Roofing operations were sublet to Koder Roofing Co., Des Moines.

Design features

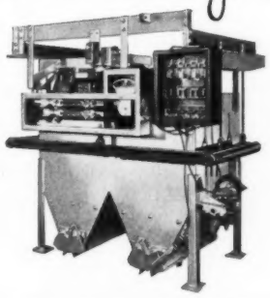
The design of the auditorium and the facilities with which it will be equipped make the building adaptable for many uses. As an auditorium for conventions, meetings, or shows, the main arena will be able to seat 13,550 people. A built-in ice rink measuring 85 × 200 feet will accommodate hockey games and ice shows at which as many as 10,000 spectators can be seated. For athletic events such as boxing and wrestling, seating areas can accommodate up to 15,200

(*Continued on next page*)

ROADBUILDERS!
YOU NEED ONLY 1 OPERATOR
TO BATCH

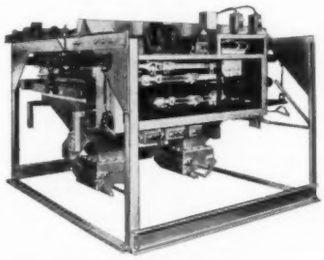


Automatically, Simultaneously...



SAND

Two batches are discharged simultaneously. Electrical controls permit operation either by man at cement batcher, by the truck driver or, if required, by operator stationed on the sand batching plant.



CEMENT

Here one man may operate all 3 units or the cement batcher alone. Hoppers are quickly and accurately charged by ingenious combination of rotary gate (for speed) and vane feeder (for final accuracy).

STONE

Two batches, each comprised of 2 sizes of stone are discharged into the truck in the same instant. Cross feeds from each battery of hoppers to batchers provide correct proportion of each size of stone in each batch.

with the new
BUTLER 0-1-0
Road Builders Plant

Electrically operated controls are centralized at the cement batcher so that one man operates any one, two or all three plants simultaneously — and at the touch of a finger. That's performance that easily keeps pace with two 34E pavers.

Relays on each plant are pre-set for the specified batch proportions and continue those cycles unless at some point the engineer requires a change. New proportioning is then quickly and easily established.

So versatile,* however, is the BUTLER 0-1-0 that, if the contractor prefers, the truck driver himself can actuate either the sand or stone batchers without leaving the truck cab.

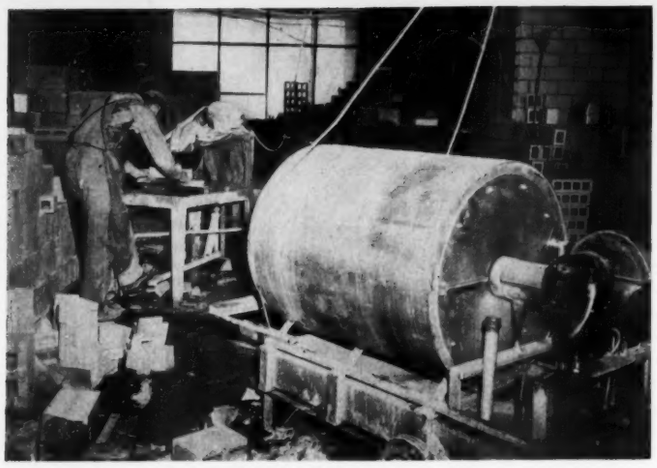
Important for quick set-up time are the special electrical connectors between the batchers. Interconnection is as simple as plugging in your toaster.

In the 0-1-0 BUTLER has provided new and more profitable horizons for the contractor in automatic operation at higher production levels. And for the supervising engineer the 0-1-0 attains perfect and constant foolproof accuracy.

Please write for the complete story about the 0-1-0.

*Should local regulations require, each batcher may be controlled by its own operator.

BUTLER BIN CO.
971 Blackstone Avenue
Waukesha • Wisconsin



Concrete blocks and masonry tile for partitions in the basement are cut to exact sizes on a Champion masonry saw. The Silent Glow oil-burning heater, foreground, permits work to continue in the cold weather. *C&E Staff Photo*

(Continued from preceding page)

spectators. For exhibition purposes, the main arena floor plus the basement provide a combined floor area of 96,300 square feet and will accommodate more than 500 exhibit booths.

Taking advantage of the sloping topography of the site, the designers have provided entrances at grade directly to the arena floor from the north and west sides, and grade entrances to the basement on the south and east sides. Large doors on the north and east sides provide entrance for trucks or large pieces of equipment to both basement and arena floors. Two wide ramps and six main stairways give adequate access between the basement and arena floors.

The balcony, containing 7,200 permanent seats, is supported on the arena floor at the lower level and on the rigid frames at the top. It is also interesting to note that walls above the first floor level are supported on the steel framework, while the basement wall rests on its own footings and is entirely independent of the steel framework. The building, therefore, is like two separate structures superimposed one on the other. The basement and first floor form a complete unit. The steel frame carrying the side walls above the first floor, with the roof, forms practically an independent structure enclosing the area above the first floor.

Excavation for levees

Neumann's first operation, after wrecking some old buildings on the site, was the excavation for the building footings and basement and general grading of the site. Approximately 306,000 cubic yards of earth was moved, and practically all of this had to be hauled away.

Two Northwest cranes with 1¼-yard dragline buckets excavated most of the material, loading a fleet of Ford dump trucks which hauled the earth to locations on the river dikes. Thus all of the waste material was utilized to strengthen the city's flood-protection system. Hauls ranged from half a mile to 3 miles. Allis-Chalmers tractors and dozers assisted at both the loading and dumping areas. Footing excavations were carried down below normal grades by an Insley backhoe.

Pile footings were required under approximately 60 per cent of the building. Reinforced-concrete piles averaging 16 feet in length were driven by a Vulcan No. 1 steam hammer in swinging leads handled by a Northwest crane. The piles were square in cross section and tapered from 16 inches at the top to 8 inches at the bottom. Spread concrete footings support the remainder of the structure.

Cylindrical concrete columns poured in Des Lauriers column molds carry the first floor loads to the footings. Columns are spaced 27 feet 2 inches in the east and west direction, and from about 16 to 22.5 feet in the north-south direction. Nominal height of these columns is about 18 feet, although there is considerable variation because of the differences in first-floor slab thickness.

Forming floor slab

First-floor thickness varies from a minimum of about 12 inches to a maximum of 34 inches. Since the top of the floor is essentially level, all of the variations appear on the underside of the slab. One of the factors requiring the extreme depth of slab is the construction of the ice-rink portion of the floor. In this area, the finish floor must be level with the rest of the arena floor, but the coolant pipes and insulation require that the

New Increased Power International T

NEW Power... New gearing... New ruggedness—for greater production
NEW Track Frames... 300 per cent stronger
NEW Finger-Tip Power Steering... advanced hydraulic design
NEW Operator Compartment... comfortable driver's seat—easy-to-reach controls
NEW Track Roller Oil Seals... 500-hour period between lubrications
NEW Positive Self-Energizing Brakes, 13% more effective brake area
NEW Appearance... sleek grille, heavy fenders, 75-gallon fuel tank. Better visibility... control-tower view front and rear

LOOK AT THAT LOAD as operator applies 103-drawbar hp of new TD-18A. Steering is effortless with new hydraulic finger-tip controls and positive, self-energizing brakes.

structural floor slab be considerably depressed.

In designing his forms for this floor, the contractor decided to construct his basic form at an elevation low enough to accommodate the maximum depth of floor slab, and then block up in other areas to reach the required elevations. Basic form supports were a series of 8×8 posts all the same length and spaced from 7.25 to 9 feet apart. Resting on these posts were continuous girders made up of three 3×12 timbers bolted together and with joints staggered. Posts and girders were drilled with a template so that a standard steel gusset plate could be used to connect them.

Where the slab is deepest, the plywood form was supported on 2×6 joists resting directly on the girders. For thinner slab sections, 3×12 joists spanned between the girders with crisscrossed fillers of the required thickness raising the form to the proper elevation. An Insley crane working under the slab at the basement level set long sections of the continuous girders with columns attached in a single lift. It was estimated that the machine raised as much as 14,000 pounds of wood form in a single lift. Although this method of forming appeared to require a large amount of lumber, the convenience of building and wrecking the form for several re-uses proved to be time-saving and economical.

Basement walls on all but the south side are poured concrete retaining walls. Economy wall forms were used to form the vertical faces of these

An International TD-14 tractor with Heil dozer cleans up debris from demolished buildings in the parking area adjacent to the new auditorium. In the background, cranes lift structural steel to the roof. *C&E Staff Photo*

TD-18A Now with 103 Drawbar H.P.

Here's the crawler tractor with everything contractors need to meet increased competition—increased workpower, increased ease of operation, increased durability:

The improved INTERNATIONAL TD-18A, now with 103-drawbar horsepower at 24,300 lbs. maximum drawbar pull in first gear at rated rpm.

Double check all these great new TD-18A features—right here on these pages—on your job where you can take over the controls and appraise their value in extra work done for lower cost. Your INTERNATIONAL Industrial Power Distributor will arrange your own personal shake-down test of the TD-18A any time you say.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

walls. The south wall is of masonry construction. Exterior walls above the first floor are brick and stone backed with tile. Interior walls are painted Haydite blocks except for areas finished in glazed tile. Patent pipe scaffolding carried the crews building the inside walls, and Patent hanging scaffolds were used on the exterior walls.

Concrete mixed on site

With the exception of a few small footing pours, all concrete was mixed on the job. Materials were dry-batched from the plant of the Crown Concrete Co. and delivered to the job by batch trucks carrying four 1-yard batches. A Koehring 27-E paver did the mixing. Some of the concrete was bucketed directly to the forms by a Northwest crane using a 1-yard bucket. In areas where the crane could not reach, buggies were used. Mall vibrators assisted in compacting the concrete.

Concrete-pouring operations were carried on throughout the winter. Where possible, the cold-weather pours were confined to protected areas such as the basement-floor slab, but some of the first-floor slab was also poured during low temperatures. Silent Glow oil-burning heaters inside protective coverings maintained suitable temperatures for pouring and curing the concrete. Two per cent of calcium chloride was added to the mix during cold weather.

A normal concrete batch consisted of the following:

Cement	612 lbs.
Sand	1,400 lbs.
Crushed limestone	1,688 lbs.
Pozzolith	1.5 lbs.

After the steel frame had been erected, the balcony structures were formed and concrete placed above the first floor level. These forms were carried on Roos adjustable shores which rested on the concrete of the arena floor. Some shores were fitted with T-tops to support the beam bottoms. Others carried double 2×6 stringers. Over these stringers 2×6 joist bearers supported the system of

Ceco steel pans which formed the joist and slab floor. Pans were 12 inches deep and 20 inches wide.

For pouring the balconies, the paver was moved in on the arena floor and batch trucks drove in on the floor and dumped directly into the skip. A Northwest crane, also operating on the floor, hoisted the concrete buckets to the forms for placing. A layer of sand was placed over the first floor as an aid in curing the concrete, and this sand layer was maintained while the heavy equipment operated on the floor.

In the basement, tile and cement-block partitions separate maintenance and utility areas from the main exhibition area. Other sections are partitioned off for lavatories, storerooms, and offices. Cement blocks and glazed tile were cut to exact sizes and shapes during the construction of these rooms by a Champion masonry saw using a diamond blade.

Outside the building, the general contractor built concrete sidewalks and driveways and graded parking areas to receive a blacktop surfacing. Bituminous surfacing was applied by the City of Des Moines.

A Veterans Memorial Commission was established in Des Moines as the administrative authority for the construction, operation, and maintenance of the auditorium. Allen Whitfield is chairman of this commission. Charles A. Dutt served as architect's superintendent, representing the Des Moines Architects Commission and the chief architects, Tinsley, Higgins, Lighter & Lyon.

Superintendent for Arthur H. Neumann & Bros., Inc., was Joseph W. Kapfer. Assisting him were Bud Sharp, in charge of the ironworkers, and Glenn Ackerland, carpenter foreman. THE END

New York Trap Rock Corp. buys West Nyack quarry

Plans to purchase the land, plants, and equipment of the West Nyack Trap Rock Co., West Nyack, N. Y., have been announced by the New York Trap Rock Corp., New York, N. Y. The acquisition, title for which will be closed by December 15 of this year, involves a purchase price of more than one million dollars.

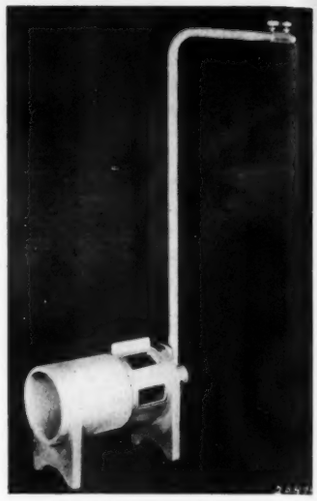
The West Nyack property comprises more than 150 acres of land, 120 acres of which are stone bearing and contain an estimated 25,000,000 cubic yards of crushed trap rock. The plant has an estimated stone-producing capacity of 500,000 tons. The 40 employees of West Nyack Trap Rock will form the nucleus of an expanded work force.

New York Trap Rock Corp. presently operates quarries at Haverstraw, Tomkins Cove, Clinton Point, and Verplanck, N. Y. The firm last year produced a total of 5,000,000 tons of stone products.

Butler Bin promotes two

Butler Bin Co., Waukesha, Wis., manufacturer of concrete batching equipment, has elected Kenneth P. Kerr vice president in charge of sales, and Morgan Robert Butler, Jr., vice president in charge of production.

Mr. Kerr, sales manager for the firm for the past twelve years, joined the company in 1929. Mr. Butler has been associated with research and manufacturing since 1938.



The new Weldit T-3 Melterama tar-kettle burner.

Tar-kettle burner

■ A new tar-kettle burner has been placed on the market by Weldit, Inc., 990 Oakman Blvd., Detroit, Mich. The T-3 Melterama burner features both high and low heat control, air-shutter flame control, and a replaceable burner orifice of new design.

Used with the Weldit 4826-D safety check or high-pressure regulator, the burner gives instant clean controlled heat. A cast-iron base and steel and brass burner are incorporated into one unit for stability and convenience.

For further information write to the company, or use the Request Card at page 18. Circle No. 528.

"Quick-Way" appoints

Heading the newly established export department of "Quick-Way" Truck Shovel Co., Denver, Colo., is Howard J. Weber. Prior to becoming export sales manager, Mr. Weber was associated with a distributor for the same company in the Far East.

The man behind the gun will tell you...

WHITE GIVES YOU

greater, longer-lasting precision...

Shown, model 7014 with "A" standard. Model 7020, same unit with "U" standard, also available.

yet costs less than other quality engineers' transits

LIKE every White quality-built instrument, these engineers' transits give you greater dollar-for-dollar value than any other comparable unit.

For example: White uses a recently-developed Swiss Dividing Engine to cut graduations into solid silver. This insures super-precision from the beginning, safeguards it through more years of hard field usage.

In addition, White engineers' transits give you internal focusing, covered leveling screws and coated optics. These and a host of other design and operating features combine to give you a transit unsurpassed for ease, speed, accuracy, economy and long-lived dependability. Write for Bulletin 1053 and the name of your nearest dealer. DAVID WHITE COMPANY, 359 W. Court Street, Milwaukee 12, Wisconsin.

DAVID WHITE COMPANY

We offer expert REPAIR SERVICE on all makes, all types of instruments

SUBSCOUT . . .

Self-contained shallow water depth indicator.

No electricity or batteries, installation or maintenance. Portable. MOST ACCURATE. Ten day trial offer. One year written guaranty.

M-1 ..... 0-25' $69.95
M-2 ..... 0-50' $99.50
CUSTOM MODELS AVAILABLE

SENTINEL . . .

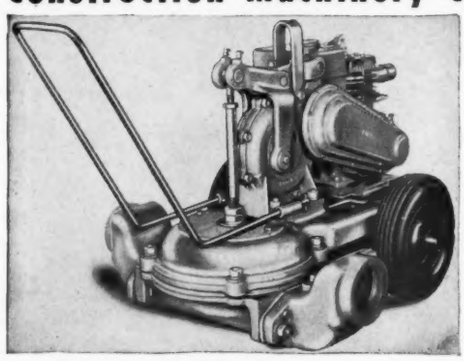
Portable Liquid Level Alarm.

Horn warns of shallow water while at anchor or underway. Place anywhere, like alarm clock. Ten day trial offer. One year written guaranty. Only one in existence.

0-12' $149.95
CUSTOM MODELS AVAILABLE

AERCO INDUSTRIES Dept. "H" Box 996, Springfield, Mass.

Two revolutionary new pumps announced by Construction Machinery Company, Waterloo, Iowa

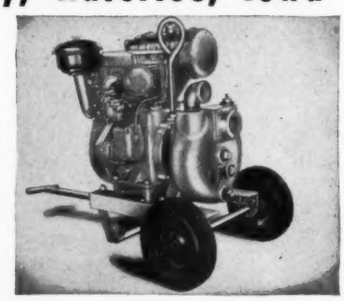


A NEW TYPE VARIABLE-SPEED, VERTICAL-STROKE PLUNGER that assures a much longer diaphragm life and greatly increased efficiency, is a real money-saving feature of CMC'S new SKWEE-GEE diaphragm pump.

A combination 2" and 3" pumper, the SKWEE-GEE is now the best pump in the business for jobs ranging from de-watering to pumping sludge. Can't be beat for high suction lifts, seepage control, small well-point dewatering jobs.

SKWEE-GEE primes dry at 25 feet. Provides total heads up to 40 feet. Standard plunger stroke 3" with alternate 2¾" by simple adjustment. Briggs air-cooled engine.

Write for Bulletin FD-L3-55. **Construction Machinery Company,** Waterloo, Iowa.



TWICE THE PRESSURE of ordinary single impeller pumps is delivered by CMC'S new and different 2-stage dual primer, Model TS-7.

A 1½" pumper with unique type impeller, it's excellent for such jobs as pumping through extended lines and washing equipment. Fine for suction lifts up to 25 feet.

Write for Bulletin TS-7, **Construction Machinery Company,** Waterloo, Iowa.

A Complete Line of Dual Primers from 1" to 10"

Fundamental facts about soil-cement stabilization

■ A brochure from Pettibone Wood Mfg. Co., 6900 Tujunga Ave., North Hollywood, Calif., explains the procedures used in soil-cement stabilization in considerable detail. It also describes the advantages of doing this type of work with Pettibone Wood equipment.

Either native soils or imported materials can be processed by the Wood equipment under controlled conditions in only three operations: preparation of materials, mixing, and laydown. Soil-cement stabilization is being widely used as a low-cost base in the construction of streets, roads, airports, and parking lots.

Beginning with a simple definition of what soil-cement is, the brochure shows the kind of soils that can be used, how soil-cement stands up, how fast it can be laid, what size jobs it can be used on, and how it is processed. The low-cost aspects of soil-cement are emphasized, and the advantages of rebuilding existing roads and shoulders by salvaging asphaltic materials already in place and stabilizing them in cement are discussed.

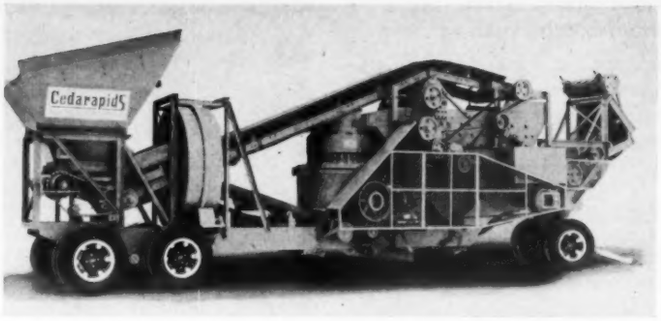
Pettibone Wood equipment illustrated in such work includes, the Preparizer, Roadmixer, windrow proportioner, spreader box, and cement bulker.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 434.

Galion appointment

Sales and service training on motor graders and rollers manufactured by the Galion Iron Works & Mfg. Co., Galion, Ohio, has been placed under the supervision of William R. Troyer.

Formerly eastern division manager for the J. D. Adams Mfg. Co., Mr. Troyer is a graduate engineer.



The new Cedarapids Model 30-C crushing plant features a Symons cone crusher.

Secondary crushing plant for very hard materials

■ A new Cedarapids portable secondary crushing and screening plant is especially designed for use in quarries and gravel pits where material is exceptionally hard. The Model 30-C plant is equipped with a 30-inch Symons cone crusher built by Nordberg Mfg. Co., Milwaukee, Wis.

The material is fed to the plant hopper which is equipped with a 30-inch reciprocating feeder. Discharged onto a 30-inch-wide feed conveyor, the material goes to a 48-inch × 10-foot 2½-deck horizontal vibrating screen. Material retained on the top deck goes through the Symons cone crusher and is recirculated back to the screen for final sizing.

Five different screen deck arrangements are available for producing up to three finished product sizes. The Model 30-C can be driven by a 150 to 175-hp gasoline or diesel engine, or electric motor.

For further information write to Iowa Mfg. Co., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 529.

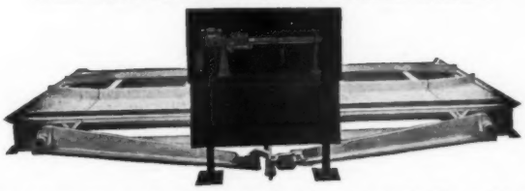
Bulletin on tow-type bituminous paver

■ The Adnun Jr. Model 8, Blaw-Knox Co.'s small-job paving machine, is the subject of a recent bulletin.

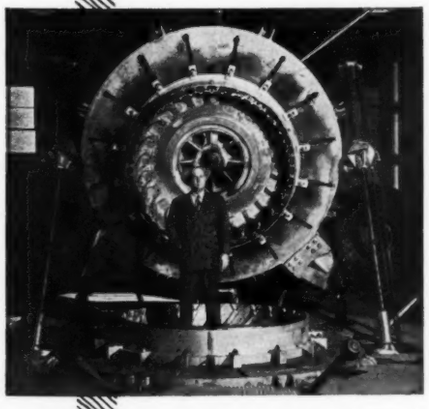
More than the typical hopper-on-wheels, the Adnun Jr. is equipped with a 12-hp motor for maneuvering the empty paver and for supplying power to the oscillating screed and rotating breaker bar. Hopper capacity of the machine, which will pave an 8-foot strip, is approximately 2 tons. The bulletin contains engineering details and on-the-job work data.

To obtain Bulletin No. 2609 write to Blaw-Knox Co., Construction Equipment Division, Pittsburgh 38, Pa., or use the Request Card at page 18. Circle No. 538.

WINSLOW—PORTABLE TRUCK SCALE
"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacities: 15-18-20-30 tons.
Write us for name of your nearest distributor.
WINSLOW SCALE COMPANY
P. O. Box 1198 Terre Haute, Indiana



THE GENERAL TIRE WITH NEW NYGEN CORD

Only plant in the South equipped to retread tires up through 2700-33. Retreads like new tires at 50% savings.

General's new NYGEN CORD tire has built-in strength. Pound for pound, NYGEN CORD is stronger than steel cables!

Specialists in BIG TIRE SERVICE
WITHIN 1200 MILES OF CORPUS CHRISTI

You save money when you turn your BIG TIRE troubles over to a BIG TIRE specialist. Specially designed field trucks with power tools, giant hoists and built-in light plants will keep your heavy equipment rolling. Save costly "downtime" by depending on Dickenson to get the job done right and quickly the first time.

CHECK THESE EXTRA FREE ON THE JOB SERVICES

- Complete field service with special equipment
- Fast pickup and delivery within 1200 mile radius
- Periodic inspection on-the-job
- Mount tires
- Rotate tires when necessary
- Furnish "loaners" while doing your retreading.

Dickenson dependable service is backed by 25 years experience. Let us show you how our plan can help you at no obligation to you.

WRITE • WIRE • CALL TODAY — COLLECT
DICKENSON GENERAL TIRE SERVICE
323 N. Water Street • Phone 4-7773 • Corpus Christi, Texas

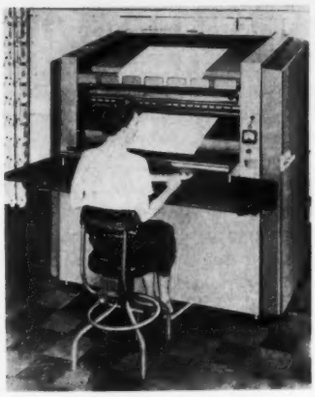
FOR COMPLETE PROTECTION AGAINST . . .

Styles illustrated
50-00 Jacket
51-05 Pants
53-15 Hat

Protective Clothing by *Sawyer*

Wears like iron — takes endless rubbing, scraping, snagging, and still gives full protection.
100% Waterproof — made with top quality base fabric saturation-coated first and then coated with 6 coats of Neoprene Latex.
Positively will not blister, crack or peel. Its longer lasting quality means greater economy.
Also: Three-quarter and long coats, aprons, coveralls and many other styles. All clothing made in black or yellow.

FROG BRAND
THE H. M. SAWYER & SON CO.
Cambridge, Massachusetts



The new Carboflex Model 500 reproduces prints up to 46 inches wide at speeds as high as 14 inches to 40 feet per minute.

Copying machine designed for volume production

■ A direct-reproduction machine designed for heavy-volume use in the engineering, drafting, and architectural fields has been announced by Charles Bruning Co., Inc., 4700 Montrose Ave., Chicago 41, Ill. The new Copyflex Model 500 offers 30 per cent greater speed, improved print stacking features, and trouble-free drive control utilizing selenium rectifiers in place of vacuum tubes.

Equipped with a 4,000-watt quartz exposure lamp, the copying machine reproduces prints up to 46 inches wide, by any length, at speeds from 14 inches to 40 feet per minute. The new speed range was selected because it does not exceed the average maximum feeding speed of the most skilled operator.

New features include 24 × 42-inch front delivery tray, a 30 × 42-inch rear tray with adjustable magnetic stops, an air-jet device for positive separation of originals from copies, a foot lever which releases stock in the machine when realigning or removal is desired, and an adjustable exposure lamp shield for processing extra-fast-printing originals.

For further information write to the company, or use the Request Card at page 18. Circle No. 544.

Rubber repair material for conveyor belts

■ A new self-vulcanizing rubber repair material designed for the quick repair of bruises, tears, and edge damage on conveyor belts is available from Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill. The Rema repair material does not require the use of heat or heavy vulcanizing equipment. No curing time is needed, so that belts may be returned to service as soon as repair work is completed.

Rema, utilizing a chemical vulcanizing process, seals the repaired area with an abrasive-resistant cover stock patch. It seals out moisture, reducing mildew, rot, and deterioration.

This new product, available in introductory kits or separately, can be applied by any maintenance man.

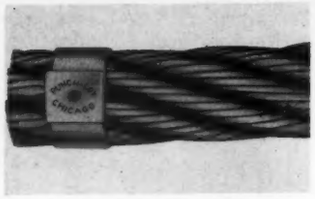
For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 472.

Hose clamp is aid in wire rope cutting

■ The use of a hose clamp will provide a quickly-applied but tight seize on wire rope that is to be cut, according to Punch-Lok Co., 321 N. Justine St., Chicago 7, Ill.

Cutting wire rope without first seizing it securely can throw it out of fabricated position and result in kinks or doglegs. Seizing with Punch-Lok hose clamps prevents any movement of the strands during the cutting operation.

On stress-free preformed rope, only one clamp is needed on each side of the cut. Clamps can then be removed or left as a permanent seize.



A Punch-Lok hose clamp can be used to seize wire rope securely when it is to be cut.

For further information write to the company, or use the Request Card at page 18. Circle No. 407.

Steel tape rule has long wide blade

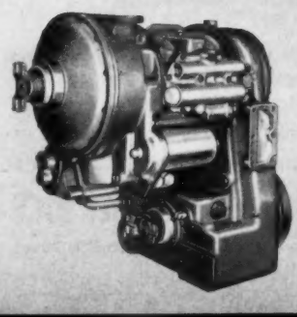
■ A steel tape rule with a white blade ¾ inch wide and 16 feet long is manufactured by Carlson & Sullivan, Inc., Monrovia, Calif. The extra length and rigidity of this rule makes it easier to use for long overhead measurements.

To speed measuring, a flush-folding rewind crank reels the long blade in and out of the metal case smoothly and without backlash. The compactly designed 2½-inch case weighs only 6¾ ounces. Big jet-black numerals on the white blade are highly

ANOTHER COMPLETELY NEW

PAYLOADER®

Biggest Yardage Producer In Its Class



COMPLETE Power-Shift Transmissi

Makes ALL Shifts WITHOUT Stopping!

This "PAYLOADER" has a newly-developed power-shift transmission which is the easiest-operating, fastest-acting, most efficient ever put into a tractor-shovel. Shifting from *any* speed range to *any* other is accomplished instantaneously by fingertip action — *on the go* — there's no stopping, no "clutching". Directional shift (forward and re is just as easy and just as fast speed ranges are provided in re as well as forward. Also includ a highly-efficient polyphase to converter that matches engine and torque to the load *in* and multiplies the engine up to 350%.

visible. The blade surface is specially processed to make it crackproof.

For further information write to the company, or use the Request Card at page 18. Circle No. 545.

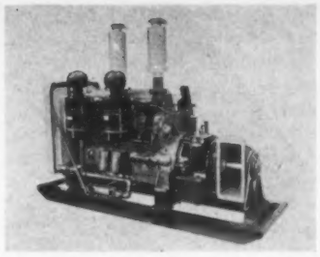
Rating chart classifies hydraulic dump hoists

■ A new hoist-classification rating chart, Issue No. 2, dated June, 1955, has just been released by the Truck Body & Equipment Association, Inc., 403 Washington Board of Trade Bldg., 1616 K St. N.W., Washington 6, D. C. The material and data in the chart was compiled by major hydraulic-hoist and steel-dump-body manufacturers which are affiliated with the association.

This chart has been published to provide a means of standardizing capacity ratings and as a convenient method of comparison of hoists. It places all hoists in classes depending upon the torque rating in inch-pounds developed by the hoist around its hinge shaft.

Also included in the chart is a table for determining the size of rating of hoist needed for any anticipated use. Body dimensions and payload tonnage figures are used in the table, which converts that information into the required hoist class needed for the given job.

To obtain this literature write to the association, or use the Request Card that is bound in at page 18. Circle No. 485.



P&H diesels ranging from 30 to 255 horsepower in size are now being marketed equipped with load-cushioning torque-converter drive.

Diesel engines equipped with torque converters

■ A line of diesel-engine torque-converter power units is announced by Harnischfeger Corp., Diesel Engine Division, Crystal Lake, Ill. Built around the lightweight P&H two-cycle engines, the torque converters provide smooth, steady power over the full speed range. The cushioning effect of the fluid drives entirely eliminates shock loads from driven equipment, resulting in better performance and longer service life. An almost infinite range of speeds may be obtained.

The P&H torque-converter drives are designed complete with their own fluid coolers. Various types of clutch arrangements are available. A tail-shaft governor is offered to control the output-shaft speed.

P&H offers diesel-engine torque-converter packages for its complete line of 2 to 6-cylinder diesels, rated at 30 to 255 horsepower.

For further information write to the company, or use the Request Card at page 18. Circle No. 466.

Heavy-duty dump bodies

■ Construction features and specifications of its Models LH-11 and H-11 heavy-duty dump bodies are contained in a new bulletin from Heil Co., 3003 W. Montana Ave., Milwaukee 1, Wis.

The sheet illustrates such Heil features as an interlaced underbody construction for minimum body distortion and floor sag; single steel-sheet body sides; one-piece corner posts; double-acting tailgates; and a reinforced head section.

To obtain Bulletin BH-55107 write to the company, or use the Request Card at page 18. Circle No. 484.

Complete purchase of H. M. Sawyer & Son

Control of H. M. Sawyer & Son Co., Cambridge, Mass., has been purchased from the estate of the late Howard M. Sawyer by a group headed by Charles L. Foote, president of the company.

The 115-year-old firm, manufacturer of safety and protective clothing and coated fabrics, will continue to operate with Mr. Foote as president and director. Robert M. Craig will be treasurer and S. Lang Makrauer, secretary. A. K. Morley Horton will continue as sales manager of the protective and safety clothing division.

• with more digging power
• with faster operating cycles
• with easier, safer operation

YOU'VE never seen anything like this big new "PAYLOADER" — because there *is* nothing else like it. Nothing else like it in design — nothing like it in performance.

No other tractor-shovel gives you the tremendous digging power; the ability to get and keep heaped bucket loads under all conditions; the *complete* power-shift transmission which speeds operating cycles; the balance and stability to handle big loads fast, safe and easy.

If you want big, steady output — dependable performance hour after hour, put this husky HO on your jobs and you'll see the difference. Stop in at your nearest "PAYLOADER" Distributor and look it over.

HOUGH-DESIGN
HOUGH-QUALITY

Safety and Stability. Special boom-arm shape and positioning keeps moving members out of operator's reach at all positions. Close, low, load-carry position and longer wheelbase provide stability and balance for fast maneuvering — with safety.

More Horsepower per bucket capacity than other standard models. Either gasoline or diesel power available.

Easy to Operate. Fullest operator visibility for safe, fast maneuvering; power steering; power-shift — no "clutching"; 4-wheel hydraulic brakes — vacuum boosted; foam rubber molded seat and back cushions; seat adjustable for operator comfort; longer wheelbase adds to rider comfort.

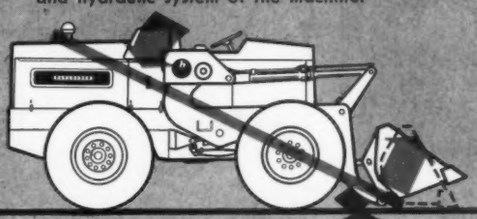
Superior Hydraulic System. Sealed, pressure-controlled hydraulic system to keep dirt and air out of oil; double-acting, long-life hydraulic rams with chrome-plated piston rods, and highest quality oil lines and fittings.

Fully-Equipped. Standard equipment includes: built-in headlights, back-up lights and tail lights; 12 volt electrical system for gas-powered units.

Extra Equipment for Greater Usefulness. Bulldozer blade, special buckets, bucket teeth, crane hook and lift fork attachments; snow plows, backhoes and many other useful and special accessories will be available.

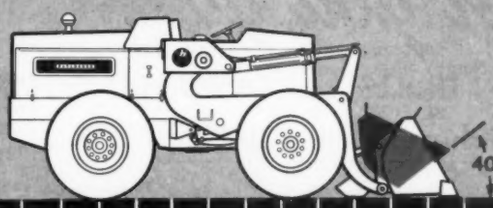
POWERFUL PRY-OUT ACTION

Tremendous pry-out force is obtained by using the breakout pads on the ground as a fulcrum for leverage. The load forces opposing the pry-out action are thus transferred to the ground through the pads instead of to the axle, wheels and hydraulic system of the machine.



40° BREAK-OUT AT GROUND LEVEL

You can get HEAPED BUCKET LOADS and you get them FASTER and EASIER WITH THIS NEW BUCKET ACTION. Most important of all — you KEEP BIGGER PAYLOADS — because the bucket can be tipped back a full 40 degrees at ground level before it is raised, eliminating spillage.



PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
762 Sunnyside Ave., Libertyville, Ill.

Send full information on the new Model HO, 2-cu. yd. "PAYLOADER"

NAME .....
TITLE .....
COMPANY .....
STREET .....
CITY .....
STATE .....

This photograph of a model of the planned passenger-terminal development at New York Idlewild Airport shows the network of roads serving the facility. Arrows indicate cut-and-fill areas in the bridge-site consolidation operation.

Fill work at bridge site starts air terminal project

Placing 45,000 tons of surcharge fill for three approaches to a highway bridge marked the beginning of the first phase of construction at the site of the new $60,000,000 passenger "Terminal City" for New York City's International Idlewild Airport.

Under a $12,408 contract, M. Parisi & Son, Inc., Maspeth, N. Y., started moving earth last March. Already completed, the fill operation was a preparatory step to construction—scheduled to get under way this fall—of a 10-mile roadway network which will serve the 655-acre terminal area.

Because the 13-year-old airport is built on hydraulic fill placed over marshy tidelands at the site of Idlewild golf course, it was necessary to achieve good consolidation of the ground at the proposed highway bridge site. The fill work was scheduled several months ahead of initial roadway work to allow for this consolidation during the intervening months.

Two Caterpillar DW21 tractors with No. 21 scrapers hauled the material, and a Cat D8 tractor was used to

Battery of Gyro-Flo powered FM-3 Wagon Drills on a New England highway construction job.

FM-3 Wagon Drills and Gyro-Flo rotary compressor at work on a California bridge approach.

I-R Gyro-Flo and FM-3 Wagon Drills speed rock removal on a large western dam project.

Light-weight JHM Wagon Drill sinking blast holes on a Canadian hydro-electric construction job.

Wherever you go...

You'll find **I-R WAGON DRILLS** and **GYRO-FLO COMPRESSORS** teamed up for high-production drilling

COST-CONSCIOUS contractors from coast to coast are speeding up their rock-drilling operations with Ingersoll-Rand Wagon Drills and Gyro-Flo portable compressors. Here's why:

The versatile, hard-slugging FM-3 Wagon Drill is unequalled for drilling power and hole-cleaning ability. It's easy to handle, even on roughest terrain — quickly set up for drilling in *any position* from vertical to horizontal. And the Gyro-Flo rotary compressor — with no valves, pistons, rods or clutch — provides smooth, closely-regulated air pressure with a minimum of maintenance.

Your I-R representative will be glad to give you the whole, cost-saving story on the extra value features of this combination. What's more, he can supply *all* your rock-drilling needs, from the Carset Jackbit all the way back to the compressor.

CONTRACTORS' COMBINATION

Ingersoll-Rand
11 BROADWAY, NEW YORK 4, N. Y.

CARSET JACKBIT

14-250

JACKHAMERS • PAVING BREAKERS • DRILLMASTERS • QUARRYMASTERS • CARSET BITS • AIR TOOLS

GREDAG
All Weather
LUBRICANTS

Cut Maintenance and Lubrication Costs on Outdoor Equipment

The enduring character of 'Gredag' lubrication gives true economy plus thorough protection against wear, rust and corrosion on exposed excavating, handling and road building equipment.

Write for FREE Descriptive Folder

GREDAG, INC.
DEPT. 7
NIAGARA FALLS, N. Y.

A Caterpillar DW21 tractor with No. 21 scraper hauls a 23-cubic-yard load of surcharge fill from the site of the planned International arrival building to the site of the highway bridge. Consolidation of ground at the bridge site was the initial operation on the project. *C&E Staff Photo*

push-load the scrapers. All the material was obtained from a 4-acre area on which the International arrival building and two adjacent airline wing buildings will be built.

Plans for the "Terminal City" development at the 5,070-acre airport include construction of the arrival building and flanking airline wing buildings (these three buildings will stretch for 11 city blocks along Jamaica Bay), seven individual airline terminal buildings, and roadways, parking areas, taxiways, aprons, and related facilities—all within a 655-acre landscaped oval.

When the entire project is completed early in 1957, the terminal area will be able to accommodate 140 aircraft at one time. The passenger terminal buildings will have an aggregate floor area of over one million square feet. At present, the airport accommodates only 29 aircraft at one time.

Since 1951, plane movements, the number of passengers, and the amount of air cargo and air mail at the airport each year have almost tripled. It is estimated that by 1965 the number of international and domestic passengers passing through the airport will total 8,500,000—an increase of nearly 300 per cent.

New York International Airport is operated by the Port of New York Authority under the terms of a 50-year lease signed in 1947 between the Authority and New York City. The bi-state Authority also operates and is developing La Guardia Airport, New York City, and Newark and Teterboro Airports in New Jersey.

THE END

Specifications on engine

■ A booklet describing the International U-282 carbureted power unit is available on request. This power unit, which runs on either gasoline or natural gas, develops 75.5 horsepower at 2,400 rpm. As an engine without radiator, fan, or clutch, the U-282 develops 79.1 horsepower at 2,400 rpm.

The six-cylinder valve-in-head engine has a 6.5 to 1 compression ratio. Its construction includes a counter-balanced crankshaft, four precision replaceable bearings, T-slot aluminum alloy pistons, heavy industrial flywheel, and torsional vibration damper.

Full specifications and performance charts on the U-282 are included in the new pamphlet, as well as a description of available attachments.

To obtain this literature write to International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the card at page 18. Circle No. 531.

BUILT TO YOUR needs from standard parts

15-HP SPECIAL PURPOSE HOIST
single fixed drum, worm gear drive

Meet your hoisting needs *precisely* at lowest possible cost. Call on our long experience in modifying and re-combining standard parts to meet specialized hoisting requirements.

Write for bulletins and catalogs

SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

Main Office and Works:
SUPERIOR, WISCONSIN, U. S. A.
New York Office, 7 Dey St., N. Y. 7, N. Y.

Special Report to Batch Plant Operators

HELTZEL'S AMAZINGLY ACCURATE CEMENT VALVE PROVED BEST FOR AUTOMATIC BATCHING

The heart of any cement batching plant is the valve that controls the flow of cement into the batchers. Those who know batching consider the Heltzel Tubular Cement Valve (Fig. 1) the finest ever developed, for two standout reasons:

First, the Heltzel Tubular Valve conforms to the condition of the material. If the cement is fluid and running fast, the opening can be restricted to control the flow. If the cement is compact and running slow, the valve can be opened to compensate.

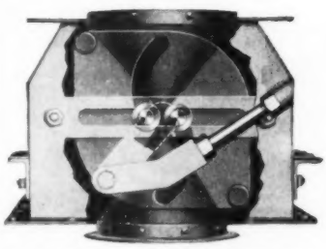


Fig. 1 Heltzel's Popular Tubular Cement Valve.

Second, the working parts of the valve are entirely enclosed, away from the cement. Ordinary plug valves are open to the cement and frequently clog and bind, necessitating work stoppage for repairs. This can never happen with the Heltzel Tubular Valve because the working parts are never exposed to the material.

These two highly desirable valve features make the Heltzel Tubular the perfect valve, where flow control and reliability are considered important. The Heltzel Tubular Valve is standard on all Heltzel Cement Plants—straight or combination. It can be operated manually or by means of an air or hydraulic cylinder, as the customer requires. It is used on Heltzel Recirculators and cement loading bins as a control valve or gate.

The Perfect Automatic Valve

For automatic cement batching, from either the straight cement or the combination plant, Heltzel engineers have developed the Heltzel Combination Rotary Feeder-Tubular Valve (Fig. 2). Note in the charge sequence, pictured at the bottom of this page, when the batch cycle is started (Fig. 3) both the Tubular Valve and the Rotary Feeder function simultaneously. When 90 to 95% of the batch has been weighed the scale automatically closes the Tubular Valve. The Rotary Feeder continues to operate (Fig. 4) until the final few pounds are weighed in. When the scale reaches the desired weight, compensated for mid-air material, a motor brake stops the Feeder instantly (Fig. 5).

Speed Plus Accuracy

This combination of Rotary Feeder and the Heltzel Tubular Valve means unparalleled speed with pinpoint accuracy—the ideal conditions for efficient automatic batching. And, the Heltzel Combination Rotary Feeder-Tubular Valve greatly reduces the possibility of work stoppage due to valve failure. If the standard rotary feeder or rotary plug valve mal-functions, or a power failure occur, the plant cannot be operated. With the Heltzel Combination Valve, the plant is still operative, because the cement can be gravity fed into the batcher manually through the Tubular Valve.

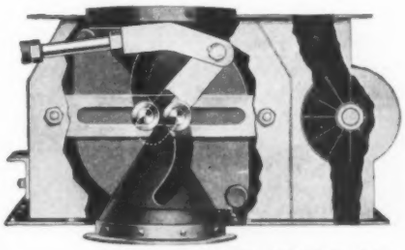


Fig. 2 The New Heltzel Combination Rotary Feeder-Tubular Valve.

If you use batching equipment, cement, aggregate or combination—portable or stationary—it will pay you to look over the Heltzel complete line of Batchmasters—the finest, fastest most accurate and dependable plants available today. Literature available. State your requirements and booklets covering your type operation will be sent to you by return mail.

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41000 Thomas Road
WARREN, OHIO

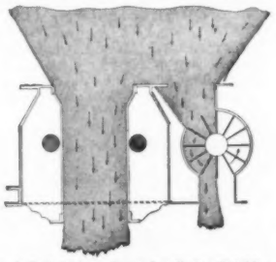

Fig. 3 Both Valves Open for Faster Batching.

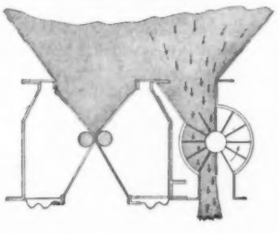

Fig. 4 Last Few Lbs. Rotary Fed for Greater Accuracy.

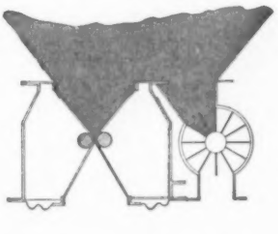

Fig. 5 Both Valves Close, Ready for Next Cycle

The project manager checks with one of his foremen before taking off for a tour of the 3-mile thruway job.
C&E Staff Photos

Stopping off at the maintenance and materials yard, Lyttle gets some action on moving reinforcing steel.

A day with the project boss

by WILLIAM T. DARDEN, assistant editor

Judgment, diplomacy, wide experience, a phenomenal memory, and an unlimited store of energy—these are the stock-in-trade of today's heavy construction project manager. Jim Lyttle, who fills the bill to the letter, is putting all of these attributes to daily use on a rough and tricky stretch of thruway just outside of New York City.

The project encompasses 3 miles of grading, blasting, cutting, filling, bridge-building, and concreting operations which are bringing costs on

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Sharpen your bid pencil with confidence and shave your quotations down to the competitive bone with OTC Power-Twin pulling equipment in firm control of that unpredictable Down Time variable. Count on OTC performance to make you more money—get you more jobs. Illustrated here are only a few of the every day jobs that are done quickly and easily with these practical pulling tools. Write for free hydraulic bulletin.
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OWATONNA TOOL COMPANY
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Logging the previous day's operations is an important part of each day's office duties for project manager Jim Lyttle. Here he dictates —mostly from memory—details of progress on every phase of the job. Two-way radio unit is at right corner of desk.

There's no such thing as an 8-hour day when you're running a big thruway job

this relatively short stretch of the New York Thruway to more than $15 million. Running this show means responsibility for more than 500 men and approximately 250 pieces of equipment assigned to complete the job by next summer.

Corbetta Construction Co., Inc., New York City, and Yonkers Contracting Co., Inc., Yonkers, N. Y., started work just north of the city line under a joint-venture contract in July of 1954. Their choice of 42-year-old Jim Lyttle (a veteran Corbetta man) as project manager of the venture appears to have been a wise one, for the job is rolling along as close to schedule as possible, considering the variables.

Keeping this project on schedule is no mean feat. Besides the work conditions and problems—by no means routine—of the job itself, there are such tricky matters as dealing with property owners along the work site and maintaining through traffic on the adjacent Central Park Avenue, which will eventually be incorporated into the thruway. These and other responsibilities keep Jim Lyttle hopping.

On a recent typical work day, Lyttle used his car, two-way radio, and telephone to keep in constant touch with every phase and development of this complex job. Though some paper work and other business necessitated his being in his office for a few hours, the greater part of the 10-hour day was spent in the field. Chronologically, the day shaped up like this:

Survey starts the day

7:30 a.m.—Jim shows up on the job, having driven about seven miles from his home in Scarsdale north of the site. Instead of going directly to his office, he spends about an hour and a half driving around the job. During this survey tour he checks and makes notes on the location of equipment and materials, the stage of each operation, and the condition of the project generally. He will draw on this information throughout the day in assigning men and machines and in dealing with problems as they arise.

9 a.m.—He checks into his office, located about midway in the project. This contractor's "shack" is a two-story brick residence which has been converted into office space for the project manager, secretaries, and other office help, and engineering and drafting staffs. Jim's office, which commands a good view of the south-

(Continued on next page)

How miller welders helped seal the arteries of America's largest single purpose power plant...

Substantial monument to Free Enterprise is OVEC and IKEC, suppliers of electric power to the Atomic Energy Commission's new uranium diffusion center in Pike County, Ohio.

Miller Selenium Rectifier d-c Arc Welder, in four wide-range models. For complete, concise, worthwhile information on these and other Miller Arc and Spot Welders, contact us today ... at no obligation, of course.

Ohio Valley Electric Corporation and its subsidiary, Indiana-Kentucky Electric Corporation, agreed to supply electric power to this great new atomic production center . . . *15 billion kilowatt-hours annually.*

Two huge generating stations are being built: The Kyger Creek Plant at Cheshire, Ohio will have five generating units of 200,000 KW each; Madison, Indiana's Clifty Creek plant will produce 1,200,000 KW with its six big generators. Each of the eleven turbo-generating units will operate off a single boiler, with super-heated steam reaching 1,050 degrees Fahrenheit under 2,000 lbs. pressure per square inch! The high temperatures and reheat, which the sponsor companies have pioneered in their own right, will make these two plants among the most economical, most efficient generating stations in the country.

These same elements, however, make the fabrication of faultless high-pressure steam lines vital . . . and extremely difficult. To accomplish this extremely important task, pipe welding specialists equipped with the maximum of engineering skill utilized the Miller Selenium Rectifier d-c Arc Welder.

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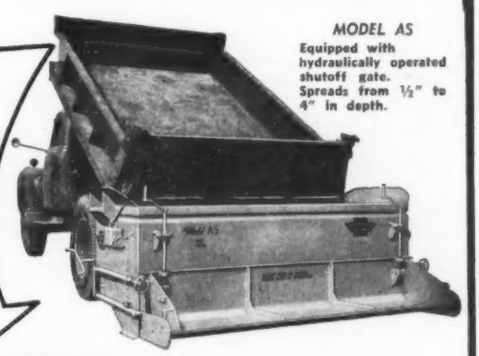

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MODEL DD
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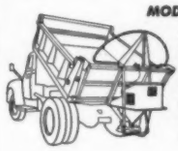

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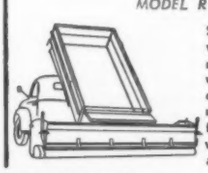

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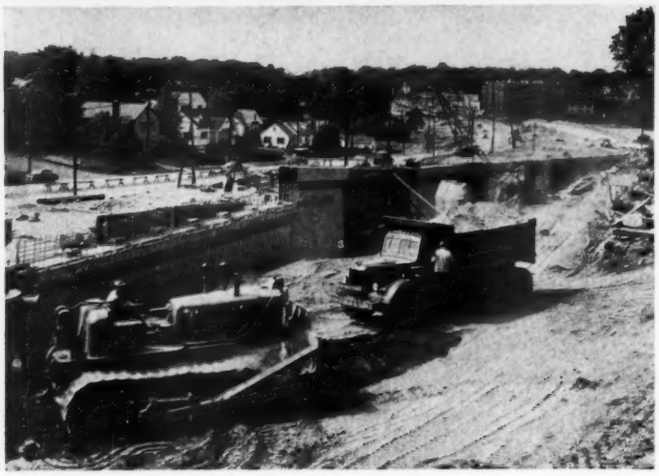

This is the view to the south from Jim Lyttle's office midway in the New York Thruway project. Just outside his office, a big Allis-Chalmers diesel tractor grades the fill material. Concrete retaining wall is at left. *C&E Staff Photo*

(Continued from preceding page)

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Time to be courteous

There are yesterday's report sheets to sign, some correspondence to look over, a consultation with his earthmoving superintendent, Bob Safford, and the inevitable telephone and radio calls. No matter how busy he is, Jim finds time to be courteous both to outsiders and to his men on the job. It's always "Good morning, Bob", or "How's everything with you this morning, Frank?" and "Thanks very much." It's easy to see that this sort of approach makes for good will between the boss and his men.

10:30 a.m.—Jim calls his secretary in to take a few important letters, but

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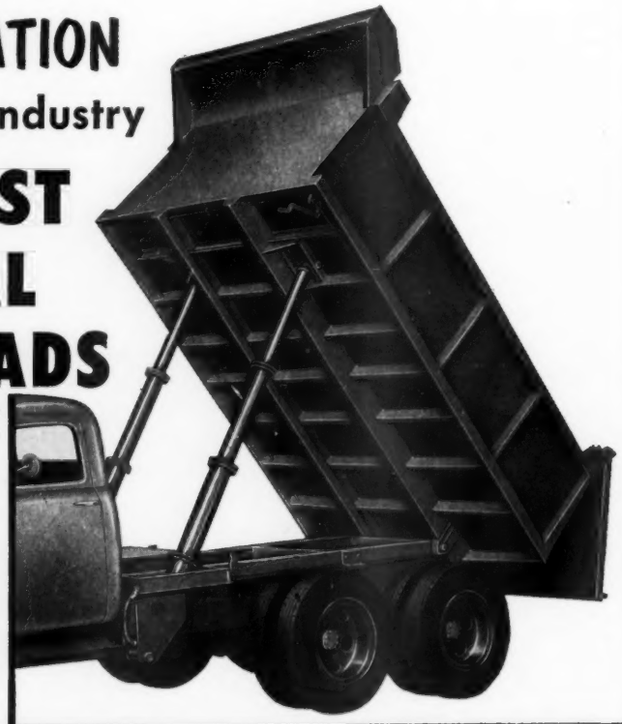

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Anthony Teleramic single cylinder hoists for single and tandem axle trucks —capacities 8 to 20 tons.

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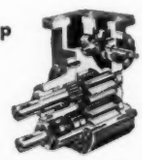
Truss rings reinforce the ends of each cylinder tube to prevent "flaring", and to adjust the packing. Extra-long bronze bearings and long overlap keeps cylinders in perfect alignment and provide extra stability and long life.

Heavy Duty *Roller Bearing* Pump



The Anthony pump on all "Teleramic" hoists is of newest "combination" design. Pump and valve are built into one housing for better control, easier servicing and longer life. Pump has finest cage type roller bearings -double shafts and replaceable bronze wearplates. Valve is positive 3-way action with auto-manual check valve.

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Please send me additional information on Anthony Teleramic Hoists used for the following body classifications.
☐ Contractor Bodies ☐ Material Yard Bodies
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I have the following make and model of truck.
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Name .....
Firm .....
Address .....
City .....
State .....

Dept. 5533
ANTHONY COMPANY
Streator, Illinois
Manufacturers of Hoists, Dump Bodies and Lift Gates for Trucks and Semi-Trailers.

the dictation is held up for a while. The radio calls for "CY-1", Jim acknowledges the call, and after a couple of brief conversations he starts in telephoning again. There are calls to the manufacturer furnishing the piles for the bridge substructures, to the commissioner of the City of Yonkers, and to the job's structural superintendent. While courteous, Jim knows how to end an interview or a telephone call so that he can get back to the many things awaiting his attention.

11:15 a.m.—A workman with some sort of personal problem comes in just as Jim is ready to start dictating. The project manager assures him the matter is being looked into, and sends him off with a joke mutually shared. Now to the dictation. First, the general operations for the previous day must be logged. Though he has notes before him, Jim relies primarily on his memory—and he reviews the finest details of yesterday's operations without faltering. The progress of each phase of work, the machinery used, and the disposition of materials are noted by the secretary for the record.

After the logging, there are one or two letters to be dictated. Even though the radio constantly interrupts him, Jim takes up just where he left off. Again it's apparent that he has every part of the operations on this job at his mental fingertips.

12 noon—It's lunch time, but not exactly relaxation time. Jim calls his structural superintendent, Roy Vitolo, by radio, arranges to meet him in five minutes at a nearby restaurant, and then hops into his car for the drive over. Lunch is accompanied by a review of some structural problems, and the paper place mat comes in handy for drawing a sketch of a particularly knotty forming problem. Jim takes notes of some problems he will check on during the afternoon. Before dessert has been brought there is a telephone call summoning Jim to a top-level conference, and the pie has to be eaten on the run.

12:45 p. m.—Jim arrives at a point about midway in the project to meet with Edward J. Petrillo, head of Yonkers Contracting Co.; Jerry Corbetta, secretary of the Corbetta Construction Co., and the job superintendents. At this point the job passes by a racetrack, and the manager of the track is anxious about the public's having access to the track at the beginning of the season. Five heads go together to iron out the problem, and a change in the schedule is decided upon.

1:15 p. m.—Now Jim sets out for a complete tour of the project. Even though he's some distance from his office, he's still available for discussions and decisions via the two-way radio.

Here and there along the project, Jim hops from his car to get a closer look at operations. He talks to foremen, looks at various operations and occasionally offers suggestions, makes notes, and runs a practiced eye over everything going on. Here a crew is using hand tools in a rock cut, and Jim radios the foremen about a mile away to ask if power drills wouldn't be better in this operation. Along the road he chats with a traffic cop about the maintenance of traffic through the adjacent road. At one end of the job, crews are gingerly digging around a maze of high-tension electric, sewer, and water lines; he comes up for a closer look and bends an ear to the foreman's problems.

A call for repairs

There's drilling going on just across across the road from this excavation, and one of the wagon drills has conked out. A crewman sees the radio antenna on Jim's car, hails the project manager, and asks him to radio the maintenance yard (about two miles away) to send a mechanic down. It takes Jim just a minute or two to do so, and the mechanic is on his way almost immediately.

JIM LYTTLE
A ten-hour day is typical, but he thrives on it.

This detailed tour of the p takes Jim several hours, but he's constant touch with the rest of the job—and with his office—all the time. He ends up at the maintenance yard, where he sizes up the repair situation, and then stops in at the materials storehouse.

4:15 p. m.—Jim is on his way back to his office. From the radio, he knows just what telephone calls are to be made, who will be stopping back to see him, and what other business awaits him. First, though, there's a brief consultation with the drafting staff in his building over some proposed changes in a detour road profile.

4:40 p. m.—Back at his desk, Jim

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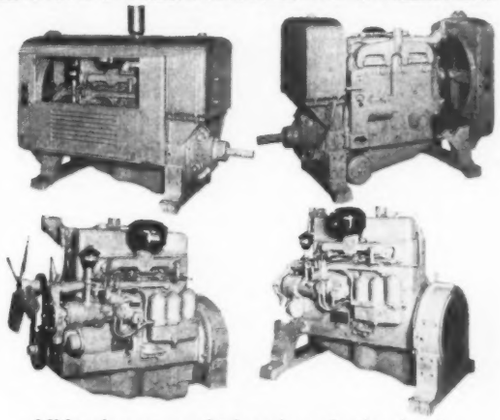

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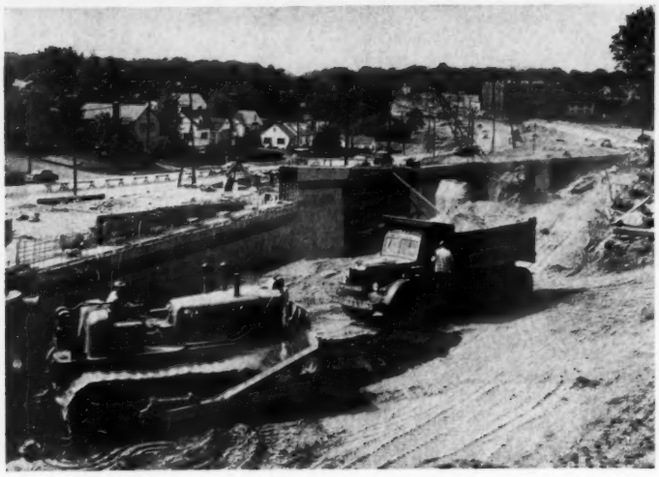

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9:45 a.m.—More telephone and radio calls. "We'll have to make a change there. I don't want to leave George on that operation; he's too expensive." This is Jim directing a reassignment of personnel—and watching the contractor's costs in the bargain. "The first and the fifteenth are iron-bound dates for getting steelwork started on those two bridges. I want to plan on that, because I'm going to schedule other work to tie right in." Here he's talking to the representative of the subcontracting firm that's doing the steelwork for the six bridges on the project.

Time to be courteous

There are yesterday's report sheets to sign, some correspondence to look over, a consultation with his earthmoving superintendent, Bob Safford, and the inevitable telephone and radio calls. No matter how busy he is, Jim finds time to be courteous both to outsiders and to his men on the job. It's always "Good morning, Bob", or "How's everything with you this morning, Frank?" and "Thanks very much." It's easy to see that this sort of approach makes for good will between the boss and his men.

10:30 a.m.—Jim calls his secretary in to take a few important letters, but

NEW SENSATION
of the dump truck industry
FOR BIGGEST LEGAL PAYLOADS

Anthony Teleramic Twin Telescopic hoists "in mount" models 6 to 13 ton capacities

Anthony Teleramic single cylinder hoists for single and tandem axle trucks —capacities 8 to 20 tons.

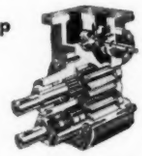
ANTHONY Teleramic HOISTS

These Telescopic Hoists let you haul up to 1,000 pounds and more *additional legal payload* on every trip. The *extreme forward* location and point of lift of these new ANTHONY Hoists shifts *all the weight of the hoist* 'way up front — *transfers more of the permissable load to the front axle* — and lets *you carry far more payload on the rear axles.* ANTHONY "Teleramic" Hoists are available for bodies 8 to 18 ft. long, in capacities from 8 to 25 tons, for all trucks — straight, 6-wheelers and semi-trailers.

With RING TRUSSED Cylinders
(Pats. applied for)

Truss rings reinforce the ends of each cylinder tube to prevent "flaring", and to adjust the packing. Extra-long bronze bearings and long overlap keeps cylinders in perfect alignment and provide extra stability and long life.

Heavy Duty *Roller Bearing* Pump



The Anthony pump on all "Teleramic" hoists is of newest "combination" design. Pump and valve are built into one housing for better control, easier servicing and longer life. Pump has finest cage type roller bearings -double shafts and replaceable bronze wearplates. Valve is positive 3-way action with auto-manual check valve.

Anthony Company
Dept. 5533
Streator, Illinois
Please send me additional information on Anthony Teleramic Hoists used for the following body classifications.
☐ Contractor Bodies ☐ Material Yard Bodies
☐ Asphalt Bodies ☐ Semi Trailers
I have the following make and model of truck.
.....
Name .....
Firm .....
Address .....
City .....
State .....

Dept. 5533
ANTHONY HYDRAULIC
ANTHONY COMPANY
Streator, Illinois
Manufacturers of Hoists, Dump Bodies and Lift Gates for Trucks and Semi-Trailers.

the dictation is held up for a while. The radio calls for "CY-1", Jim acknowledges the call, and after a couple of brief conversations he starts in telephoning again. There are calls to the manufacturer furnishing the piles for the bridge substructures, to the commissioner of the City of Yonkers, and to the job's structural superintendent. While courteous, Jim knows how to end an interview or a telephone call so that he can get back to the many things awaiting his attention.

11:15 a.m.—A workman with some sort of personal problem comes in just as Jim is ready to start dictating. The project manager assures him the matter is being looked into, and sends him off with a joke mutually shared. Now to the dictation. First, the general operations for the previous day must be logged. Though he has notes before him, Jim relies primarily on his memory—and he reviews the finest details of yesterday's operations without faltering. The progress of each phase of work, the machinery used, and the disposition of materials are noted by the secretary for the record.

After the logging, there are one or two letters to be dictated. Even though the radio constantly interrupts him, Jim takes up just where he left off. Again it's apparent that he has every part of the operations on this job at his mental fingertips.

12 noon—It's lunch time, but not exactly relaxation time. Jim calls his structural superintendent, Roy Vitolo, by radio, arranges to meet him in five minutes at a nearby restaurant, and then hops into his car for the drive over. Lunch is accompanied by a review of some structural problems, and the paper place mat comes in handy for drawing a sketch of a particularly knotty forming problem. Jim takes notes of some problems he will check on during the afternoon. Before dessert has been brought there is a telephone call summoning Jim to a top-level conference, and the pie has to be eaten on the run.

12:45 p. m.—Jim arrives at a point about midway in the project to meet with Edward J. Petrillo, head of Yonkers Contracting Co.; Jerry Corbetta, secretary of the Corbetta Construction Co., and the job superintendents. At this point the job passes by a racetrack, and the manager of the track is anxious about the public's having access to the track at the beginning of the season. Five heads go together to iron out the problem, and a change in the schedule is decided upon.

1:15 p. m.—Now Jim sets out for a complete tour of the project. Even though he's some distance from his office, he's still available for discussions and decisions via the two-way radio.

Here and there along the project, Jim hops from his car to get a closer look at operations. He talks to foremen, looks at various operations and occasionally offers suggestions, makes notes, and runs a practiced eye over everything going on. Here a crew is using hand tools in a rock cut, and Jim radios the foremen about a mile away to ask if power drills wouldn't be better in this operation. Along the road he chats with a traffic cop about the maintenance of traffic through the adjacent road. At one end of the job, crews are gingerly digging around a maze of high-tension electric, sewer, and water lines; he comes up for a closer look and bends an ear to the foreman's problems.

A call for repairs

There's drilling going on just across across the road from this excavation, and one of the wagon drills has conked out. A crewman sees the radio antenna on Jim's car, hails the project manager, and asks him to radio the maintenance yard (about two miles away) to send a mechanic down. It takes Jim just a minute or two to do so, and the mechanic is on his way almost immediately.

JIM LYTTLE
A ten-hour day is typical, but he thrives on it.

This detailed tour of the project takes Jim several hours, but he's in constant touch with the rest of the job—and with his office—all the time. He ends up at the maintenance yard, where he sizes up the repair situation, and then stops in at the materials storehouse.

4:15 p. m.—Jim is on his way back to his office. From the radio, he knows just what telephone calls are to be made, who will be stopping back to see him, and what other business awaits him. First, though, there's a brief consultation with the drafting staff in his building over some proposed changes in a detour road profile.

4:40 p. m.—Back at his desk, Jim

Yes, MM Engines are built and equipped to order

FURNISHED TO YOUR SPECIFICATIONS IN LOTS OF 1 OR 100!

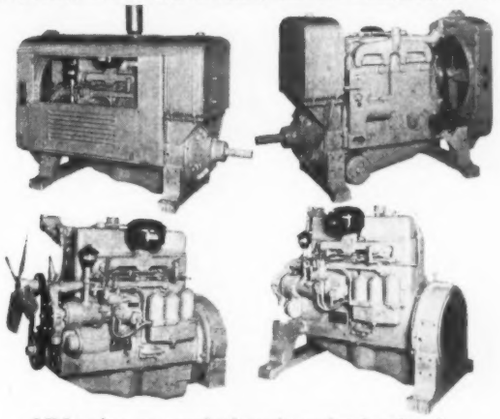
You get power adaption that fits your specifications more readily with Minneapolis-Moline engines. Why MM? Because, as an independent engine builder, no single sales outlet dictates MM engine design—and MM works in such a big variety of power applications.

To meet a wide range of basic requirements MM engines have large displacement for high torque at moderate rpm. Extra high compression and high turbulence combustion combined with high volumetric efficiency provide outstanding performance.

For these reasons MM units are ready to go when equipped with specified operating accessories. You eliminate major auxiliary unit purchases to adapt engine characteristics to meet momentary high load demands. Further long run benefits are low fuel consumption and low maintenance that total up to low cost production.

Every-day experience in supplying a wide range of unit requirements enables MM to maintain customary high quality in single or small lot quantities at reasonable cost.

A high degree of standardization results in high production parts that provide precision fits and permit MM to schedule parts for special units in large quantity, assuring early delivery and customer service.



MM engines are completely engineered and equipped for gasoline, LP gas, natural gas, or distillate fuels. Sizes range from 206 cu. in. portable units to 1600 cu. in. stationary engines and are available for fan to flywheel application or completely enclosed leg mounted installations. MM also builds a line of industrial Diesel power units: Sizes—283-, 425-, 605 cu. in.

Standard equipment includes vacuum crankcase ventilation, thermostat controlled bypass cooling, packaged water pump, built in variable speed governors, enclosed gear driven oil pump, and oversize full-flow oil filters (shunt-type filters are provided exclusive on MM Thermo-Clad units).

Send details on your application for examples of MM built-to-order packages for original or replacement needs. Engineering service available for pumps, hoists, crushers, generators, shovels, ditchers, cranes, compressors, feed mills, saw mills, planing mills and similar installations. When you want dependable performance year after year from your engine, you want an MM Industrial Power Unit.

INDUSTRIAL DIVISION

MINNEAPOLIS-MOLINE MINNEAPOLIS 1, MINNESOTA

starts telephoning. Then there's a reminder via radio that the road running alongside the project must be cleared of equipment for the weekend. More dictation is in the offing, and there are some detailed reports on the job to be filled in.

6:30 p. m.—Jim winds up his day and clears his desk for the weekend. As he drives along the project on his way home, he checks to make sure everything is shipshape for the three-day shutdown—meaning principally that the through road is clear for heavy holiday traffic.

He thrives on it

This full day is a typical one for Jim Lyttle, but he makes no bones about the fact that he loves it. He's been in on all kinds of heavy construction, but "once you've done this sort of thing, there's nothing else like it." This tricky thruway project is his biggest responsibility so far, but he seems to thrive on the challenge.

An engineering graduate of Cooper Union in New York City, Jim has been with Corbetta for 17 years. His first assignment with the firm was as field engineer on the Bronx-Whitestone Bridge project. Since then, he's supervised nearly every type of heavy construction. He's had plenty of experience with highway construction, too; just before assignment to this job he was superintendent on a 10-mile stretch of New York Thruway constructed by Corbetta and John Arborio, Inc., Poughkeepsie, N. Y., near Kingston.

Perhaps the only drawback to this job, as far as Jim Lyttle is concerned, is that it kept him from spending more of the summer evenings with his family. The Lyttles have a summer place at Monticello, near Kingston, and when Jim was superintendent of the job near Kingston he looked forward to commuting between the job and the summer place (where Mrs. Lyttle and their three children were vacationing) each day. But bigger things were in the offing, and Jim was pulled off the Kingston job to take over the tough project currently under construction.

Corbetta (not to mention Yonkers Contracting Co.) must have confidence in this project man, as the job he's managing right now is the biggest and toughest the firm has under contract. Everybody, however, agrees that the project is in good hands.

Jim Lyttle? He hasn't any time to comment. He's got his hands full—and they're calling him on the two-way radio. THE END

Highway Research Board has three new bulletins

Such subjects as training highway personnel, results of tests made on large-diameter culvert pipe, and special lanes for uphill grades, are covered in new bulletins from the Highway Research Board, 2101 Constitution Ave., Washington, D. C.

"Training Highway Department Personnel", Bulletin 103, contains two papers, "Bridging the Gap Between College and Career" and "Program for Training and Educating Employees of State Highway Departments". The first discusses the objectives, characteristics, and mechanics of a training program, while the second analyzes types of programs set up by state highway departments as of 1953.

A report of tests on 84-inch reinforced-concrete pipe, contained in Bulletin 102, shows that if special reinforcing is provided to take care of shearing stresses, the strength of the tension reinforcement can be used more effectively and crushing strength can be increased without an increase in the wall thickness of the pipe. A second paper on "Tests on Large Culvert Pipe" presents an analysis and develops a formula for predicting the vertical and horizontal deflection of timber-strutted corrugated-metal pipe culverts. This bulletin, and the booklet on training highway personnel, are available from the Highway Research Board for 45 cents each.

Bulletin 104, "Vehicle Climbing Lanes", is priced at 60 cents and consists of three reports on the need for extra lanes for slow-moving vehicles going uphill. These are concerned with determining where climbing lanes should be located, the lengths of speed-impeding zones, and the rating of ascending grades. One paper reviews some of the earliest studies made on the subject.

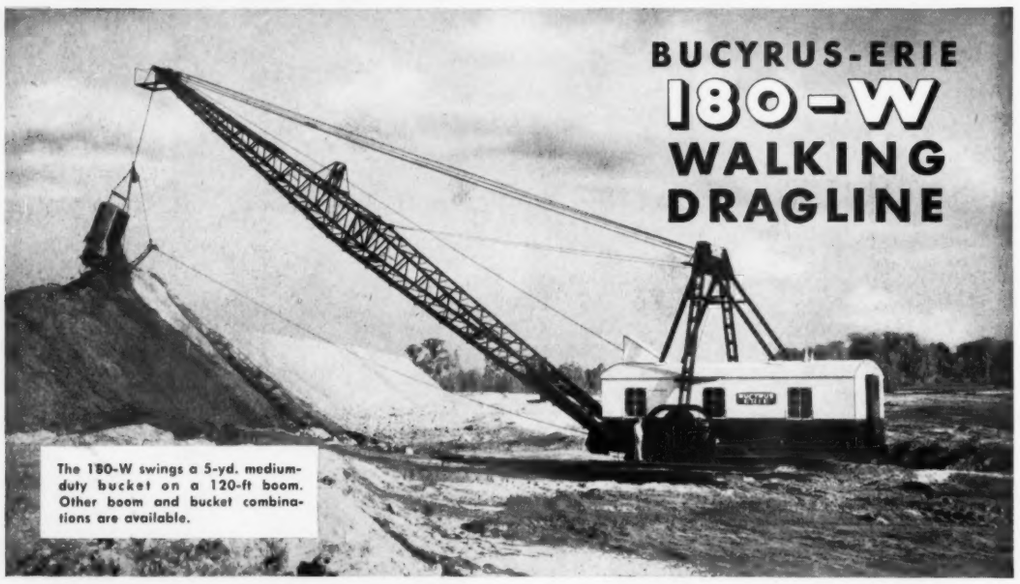
Folder on mobile cranes stresses safety features

■ A folder on Coles mobile cranes gives specifications for units rated at 4 to 23 tons in lifting capacity. The literature has separate illustrations of the power component and the undercarriage and chassis, showing their design in detail.

Emphasis is placed on the safety features found on the wheel-mounted Coles cranes. These include reversible steering that allows control by normal steering-wheel movement regardless of the position of the superstructure relative to the chassis. A safe-load indicator and cut-out switch, standard in Coles cranes, warns the driver of any tendency toward overloading in all boom positions.

To obtain this literature write to Coles Cranes, Inc., P. O. Box 942, Joliet, Ill., or use the Request Card at page 18. Circle No. 539.

HERE'S BIG-CAPACITY DIGGING ABILITY YOU CAN MOVE FROM JOB TO JOB



The 180-W swings a 5-yd. medium-duty bucket on a 120-ft boom. Other boom and bucket combinations are available.

ON levee work, dam construction, contract stripping — any big job — you are ahead with the economical, high-capacity dirt-moving offered by a Bucyrus-Erie walking dragline. In the 180-W you have it — along with unmatched ease in moving from job to job.

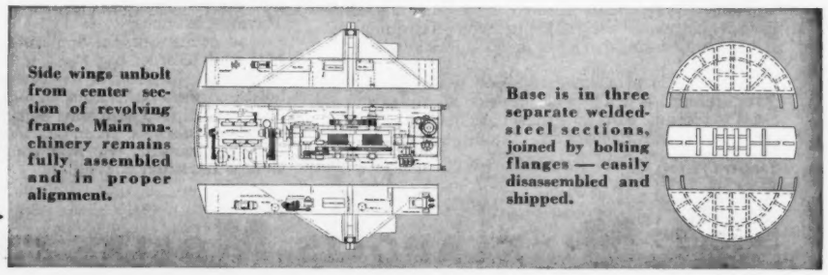
The 180-W is readily dismantled for shipping. No main machinery components are disturbed. You never need worry about misalignment problems. The complete machine is easily loaded on five U. S. railroad cars, and is easily reassembled. This ease of moving saves you time and expense and greatly increases the 180-W's value throughout its life.

Besides its unusual portability, the 180-W brings to more jobs the dependable, big-output performance, quick maneuverability, long working range, and low maintenance costs common to all Bucyrus-Erie walking draglines. Send for complete information. 50L55

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

5 U. S. RAILROAD CARS CARRY ENTIRE MACHINE


Side wings unbolt from center section of revolving frame. Main machinery remains fully assembled and in proper alignment.
Base is in three separate welded-steel sections, joined by bolting flanges — easily disassembled and shipped.

Now...

from Caterpillar

...a major

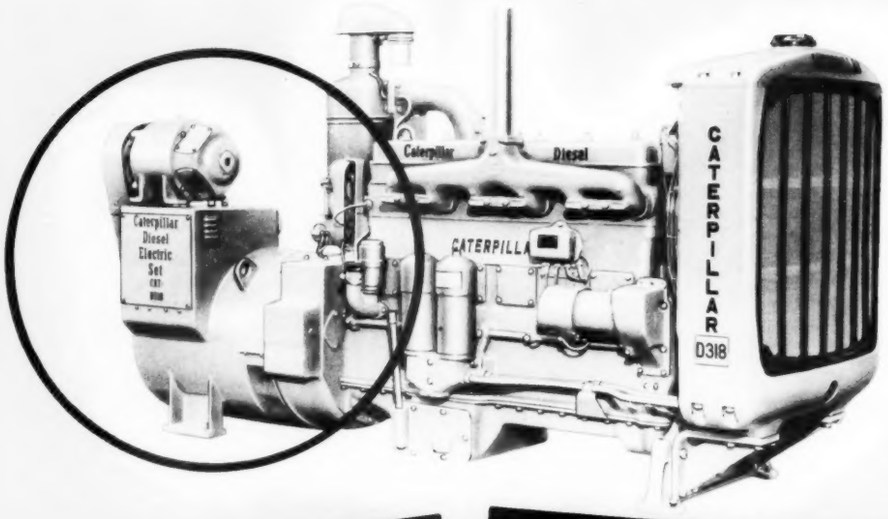
development

in

MODERN ELECTRIC POWER

The new

CATERPILLAR

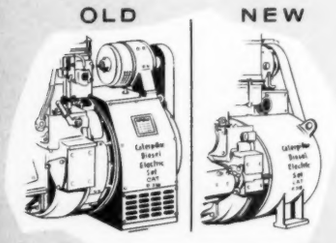


Nothing like it for simple operation, flexible application, compact power, rugged construction, long life and ease of maintenance.

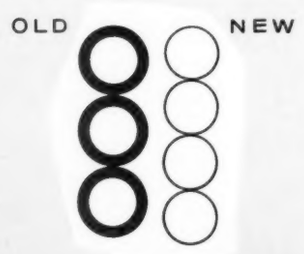
Heart of the new line of Cat Diesel Electric Sets, providing in one package the best features of self-regulated and externally-regulated generator plants—you get more for your money.

Easily paralleled with other generators now in use.

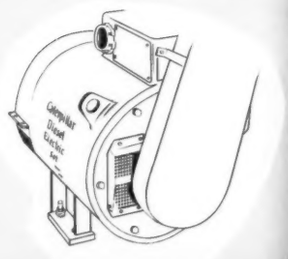
There is a big difference in size between the old and new Caterpillar Generators.



New insulation permits more compact design—exaggerated comparison in illustration below.



New design saves space. Leads can be taken from side, back or top without affecting machine width.



GENERATOR

Here is a new concept in generators – an advance that stems both from Caterpillar research and practical experience in the field of electric power.

Combining latest developments in design, materials and production, it brings to Caterpillar's new line of Diesel Electric Sets the efficiency of the externally-regulated set in a self-regulated set–you get more for your money.

These rugged power packages provide you with many new advantages. Here are a few of many features that add up to a new standard of efficient, economical performance:

- **Close regulation of voltage—no load to full load.**
- **Easy to start—require no operating adjustments. Anyone can run them.**
- **Extremely compact—big electrically, packing more power in smaller space than old style units.**
- **Easily paralleled with other generators now in use.**
- **Like all Caterpillar-built equipment—100% backed by Caterpillar.**
- **Sold and serviced by one reliable source—your nearby Caterpillar Dealer.**

Whatever your power requirements, it will pay you to look into the new Cat Diesel Electric Sets with their advance-design generators. Get the full facts about them from your Caterpillar Dealer.

MAJOR ADVANTAGES OF THE NEW CAT GENERATORS

1 **MATCHED TO ENGINE PERFORMANCE.** Each Cat Generator is designed and built to exactly match the Cat Engine powering it, assuring maximum efficiency in a simple, complete package.

2 **SELF-REGULATING, WITH CLOSE VOLTAGE REGULATION.** Designed to meet the needs of applications now served by self-regulated or externally-regulated generators, this new generator provides steady voltage from no load to full load.

3 **ADJUSTABLE FOR SPECIAL CONDITIONS.** During initial installation, the terminal voltage and voltage "droop" can be adjusted to meet the special conditions of the application. After that, the adjustments are locked and no further adjustments are necessary.

4 **EASY TO INSTALL.** No complicated switchgear or external voltage regulators are needed.

5 **VERSATILE IN APPLICATION.** Easily paralleled with other generators now in use.

6 **SMALL AND COMPACT.** Occupy less space than other generators. A reduction in frame size, close coupling, top-mounted exciter results in a shorter over-all package length.

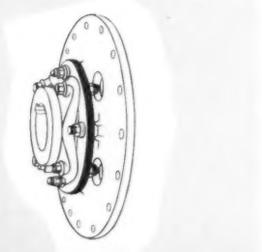
7 **BIG ELECTRICALLY.** Motor starting ability — capacity to handle the surge of heavy loads.

8 **EASY TO MAINTAIN.** Heavy-duty, single-bearing, close-coupled construction. The single bearing is easily accessible and is lubricated from an oil reservoir that requires filling only once a year.

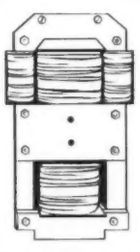
9 **RUGGEDLY CONSTRUCTED.** Heavy-duty, laminated pole rotor for improved operation and increased rotor life.

10 **DESIGNED FOR LONG LIFE.** Built to match the long life of the Caterpillar Engine powering them.

Disc-type coupling and single-bearing design save space. Single bearing is easily accessible.

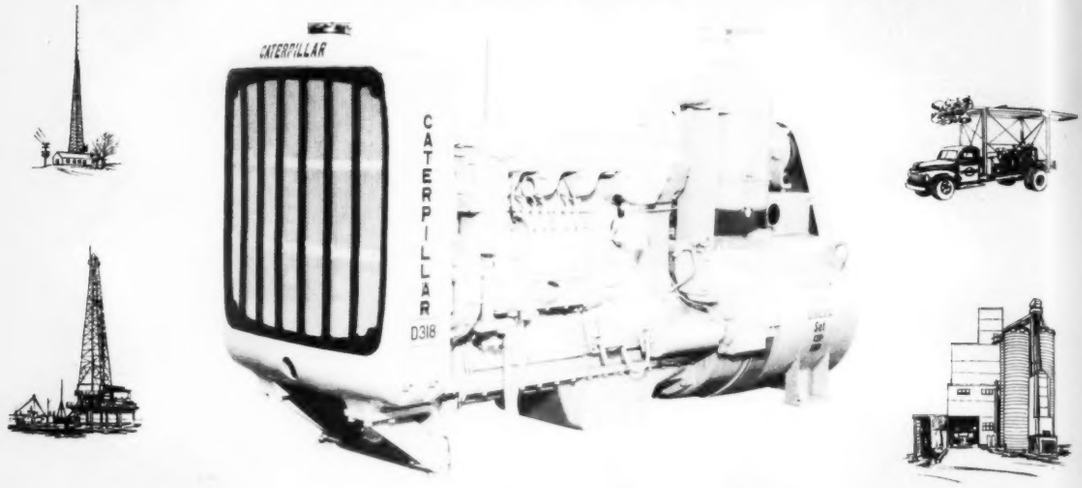


The "regulator" of the Caterpillar Generator. No moving parts — compact — reliable.



The control panel—adjustments locked at installation. No further attention required.

The new CAT* Generator



. . . another example of Caterpillar leadership in action

In 1939, Caterpillar introduced the first Cat self-regulated Electric Set.

At the time, this was a new concept in diesel-electric power.

Like most new developments, it had to win acceptance against "old, hidebound, traditional prejudices and practices."

It won acceptance — quickly and with outstanding success!

Just look at the record: since 1939, thousands of Cat Electric Sets have delivered long, reliable, economical service in widely different applications in every corner of the world. Sets with many thousands of hours of profitable operation are not uncommon. Many with more than 100,000 hours on their meters are still in use and going strong.

No matter how old they grow, not a single one ever becomes a "parts orphan." Like every Caterpillar-built machine, genuine Cat parts will be available as long as you have a need for them.

Now Caterpillar introduces another new concept in diesel-electric power—a new and better generator, heart of the new line of Caterpillar Diesel Electric Sets.

Like that 1939 "new concept of diesel-electric power," this is also backed 100%.

New design, new materials and new production techniques have made it possible for you to get more for your money in the new power packages.

See your Caterpillar Dealer about the new line today!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

MAIL TODAY!

CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.

I'd like more information on the new Cat Generator.

Name _____

Company _____

Address _____

City _____ *Zone* _____ *State* _____

CATERPILLAR*

*Cat and Caterpillar are Registered Trademarks of Caterpillar Tractor Co., U. S. A.

NEW HEAVY-DUTY ELECTRIC SETS

PRINTED IN U. S. A.

This mobile welding equipment offered by A. J. Parsons consists of a Lincoln 200 or 300-amp generator with a large built-in exciter generator.

Welding equipment mounts on four-wheel-drive truck

■ A new mobile welding unit that can travel from job to job at highway speeds is available from A. J. Parsons, Washington, Pa. The unit consists of a Lincoln 200 or 300-amp generator with a large built-in exciter generator. This equipment is mounted on a Willys four-wheel-drive Jeep or truck.

The exciter generator supplies 1 or 3 kw at 115 volts to furnish power for lights on the job or to run power tools at the same time that welding is being done. Power for the welder and generator is supplied by the truck engine by means of a belted power-takeoff system.

In addition to the power equipment, brackets for acetylene and oxygen tanks, and storage boxes for tools and equipment are built into the units. A front-mounted winch may be installed to provide a means of raising, lowering, or pulling loads in locations where other power is not available.

For further information write to the manufacturer, or use the Request Card at page 18. Circle No. 532.

Sheaves vary speed by pitch-diameter adjustments

■ Vari-Pitch sheaves permitting speed variations up to 76 per cent by means of pitch-diameter adjustments are described in a new bulletin released by Allis-Chalmers Mfg. Co., 951 S. 70th St., Milwaukee 1, Wis. Both stationary control and "motion control" models are illustrated among units of from 1 to 600-hp capacity.

Where speed changes are infrequent and the machine can be stopped, the change can be effected in a few minutes by the stationary-control-type sheave. Where frequent speed changes must be made while the sheaves are moving, the "motion-control" sheave provides automatic speed changes at a turn of a handwheel.

Included in the bulletin is a table of sizes and general dimensions of Vari-Pitch sheaves and a table of general dimensions of Paraline ball-bearing motor bases especially designed for use with the motion-control sheaves.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 457.

Partition box speeds dump-truck batching

■ Specifications and other descriptive data on the recently-announced Cem-Matic cement box are included in a new bulletin from Dravo-Doyle Co., Fifth and Liberty Aves., Pittsburgh 22, Pa.

This new product is an all-steel enclosed box which is attached to the partition gates on dump trucks used in hauling cement and aggregates to dual-drum concrete mixers. The weathertight container keeps moisture out and prevents blowing of the cement. When unloading, the cement automatically mixes with aggregate to speed up the batching operation.

To obtain Bulletin 1601 write to the company, or use the Request Card at page 18. Circle No. 411.

Automatic tail-gate lock for dump-truck bodies

■ An automatic lock that eliminates the manual locking and unlocking of dump-truck tail-gates is shown in literature from the U. N. Co., Inc., 1255 Boylston St., Boston 15, Mass. The Dun-Lockin automatic tail-gate lock unlocks the tail-gate when the dump body goes up and locks it when the body comes down.

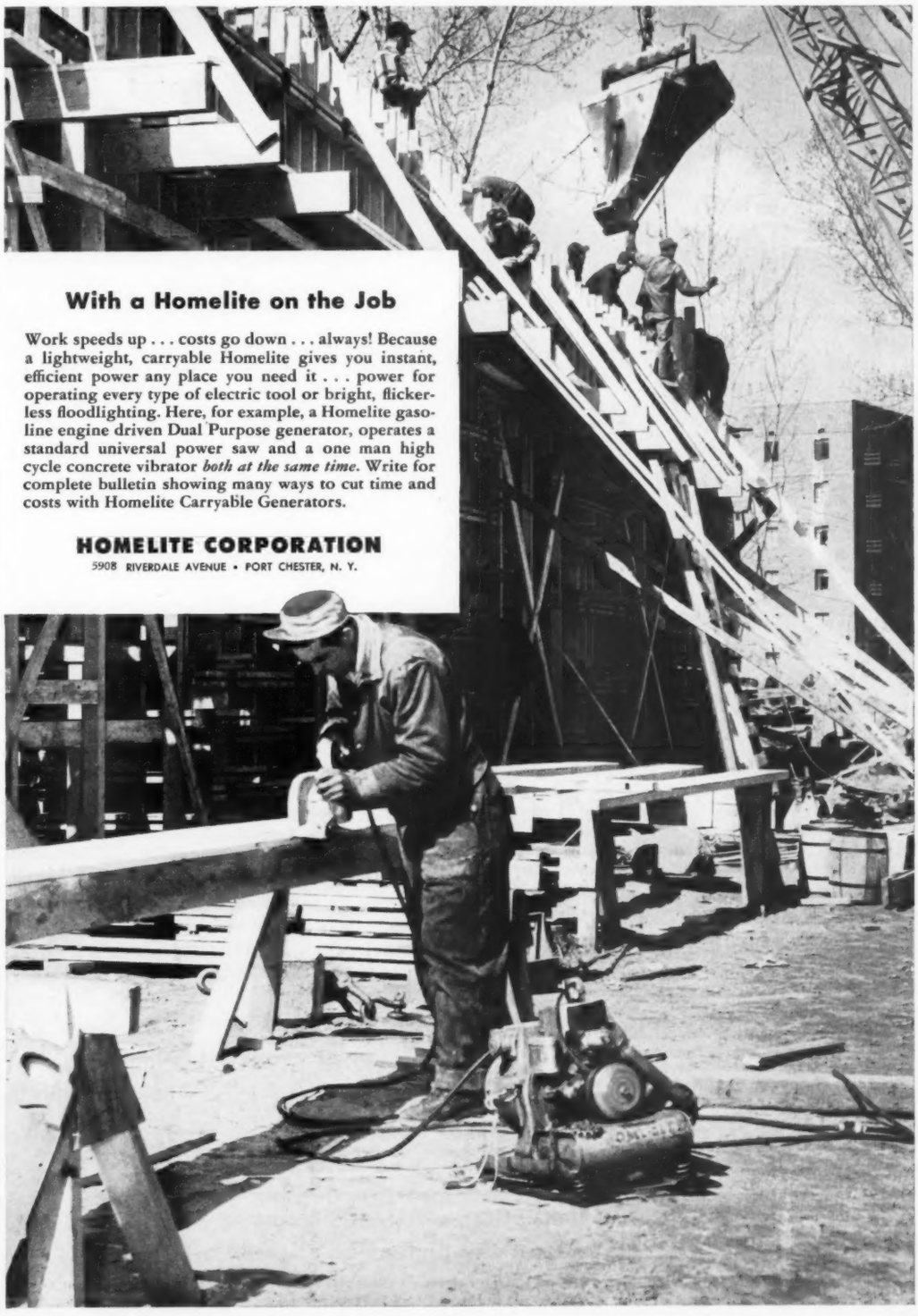
The automatic lock reduces driver fatigue and speeds load cycles. The driver need not get out of his cab, and the truck can drive away as soon as the load has been dumped and the body has descended.

The device fits all dump trucks from 1 to 14 yards in size. It can be disengaged quickly without tools for sanding or other work requiring manual control.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 533.

Clark names R. C. Andrews to division sales post

Robert C. Andrews has been appointed sales manager for the axle division of the Clark Equipment Co., Buchanan, Mich. He will supervise the division's expanded sales activities, being responsible for the staff and dealer organization. Mr. Andrews will make his headquarters in Buchanan.



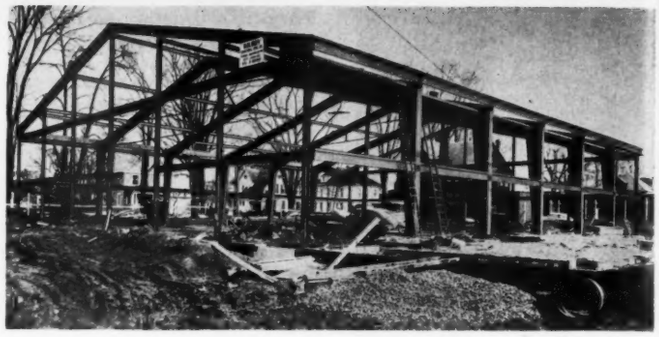
With a Homelite on the Job

Work speeds up . . . costs go down . . . always! Because a lightweight, carryable Homelite gives you instant, efficient power any place you need it . . . power for operating every type of electric tool or bright, flickerless floodlighting. Here, for example, a Homelite gasoline engine driven Dual Purpose generator, operates a standard universal power saw and a one man high cycle concrete vibrator *both at the same time*. Write for complete bulletin showing many ways to cut time and costs with Homelite Carryable Generators.

HOMELITE CORPORATION

5908 RIVERDALE AVENUE • PORT CHESTER, N. Y.

A Lincoln Electric welding gun mounted on a standard cutting buggy makes short work of welding a column-knee-rafter section of a rigid frame for a new school gymnasium. The structural material for this 120 × 104-foot high - school gymnasium (photo at right) at Elyria, Ohio, included 5 rigid frames tied together with I-beams.



Automatic setup pares time on frame-welding operation

By using semiautomatic hidden-arc equipment to weld five heavy rigid frames, the steelwork subcontractor on a new high school gymnasium project in Elyria, Ohio, shaved welding time from approximately 90 hours to a mere 12 hours. Another 300 hours in handling and back chipping also was saved in the process.

Roth Bros., Norwalk, Ohio, was general contractor on the project, and Kilroy Structural Steel Co., Cleveland, Ohio, was subcontractor for the structural steelwork.

The time-saving welding procedure was used in assembling rigid frames for the 120 × 104-foot structure, which has wall columns 21 feet high. Each of the five frames is made of two tapered all-welded column-knee-rafter sections which were tied together in the field with I-beams.

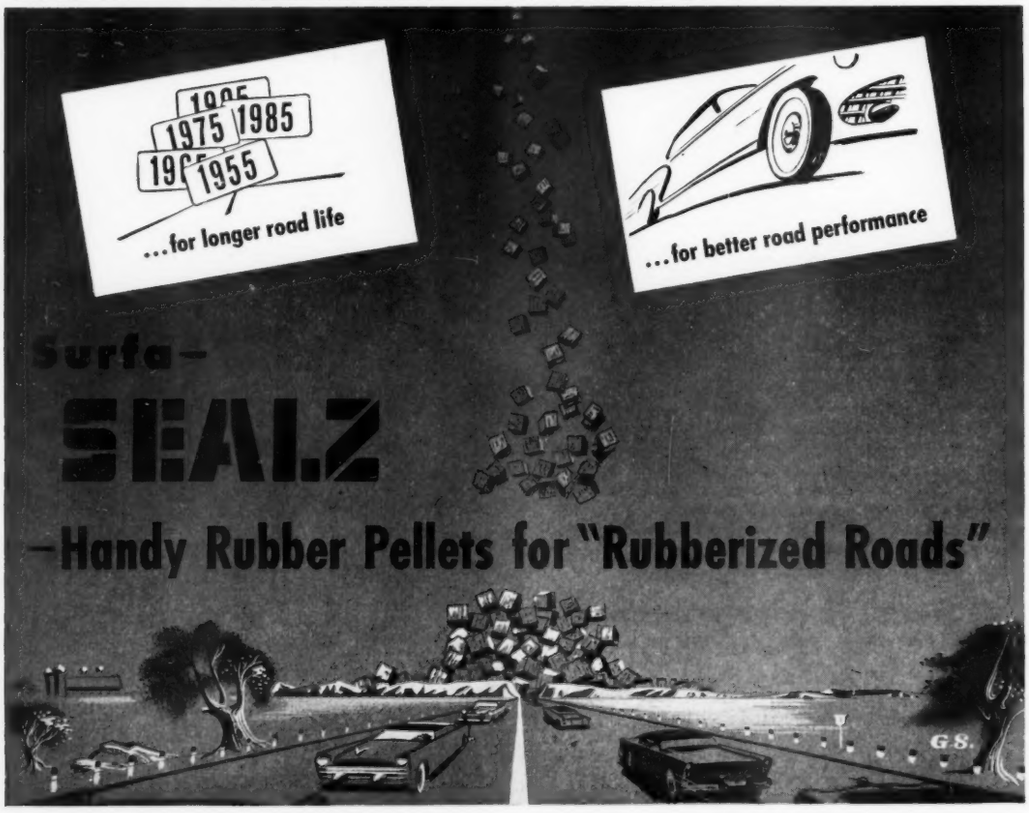
The column-knee-rafter sections were made from 27-WF-145 beams cut on a taper, with the parts turned and welded. The completed column end of each section is tapered from 14 inches at the base to 30 inches at the knee, and the rafter end is tapered from 24 to 36 inches. The rafter has a tapered insert 10 feet 8 inches long.

Kilroy mounted a Lincolnweld welding gun on a standard cutting buggy. With this virtually automatic setup, the welding was done in two passes, one from each side, at Kilroy's Cleveland shop.

According to Fred Goff, general manager of the steel subcontracting firm, a complete welding job was done on each of the ten sections in from 60 to 80 minutes. He estimates that similar welding by the conventional hand method would have taken about 9 hours for each section, not to mention about 30 hours of back chipping for each section.

Welding speed on this semiautomatic operation was 22 inches per minute. Wire used was 5/64-inch mild steel. Flux was Lincoln 840.

THE END



Without special equipment, Surfa-SEALZ Pellets make it easy to use rubber in *any* hot mix plant—make rubber pavement available for *every* job. Surfa-SEALZ Pellets (concentrated synthetic rubber in a dry form) are easily handled. Tossed into a mixing mill, they disperse rapidly, spreading rubber evenly through the mix, and once blended, they do not separate.

Surfa-SEALZ *lengthens road life* by...

MINIMIZING RUTTING! Surfa-SEALZ increases the viscosity of asphalt greatly reducing the tendency to flow under pressure.

REDUCING BRITTLENESS! Surfa-SEALZ's rubbery, highly resilient nature reduces asphalt's tendency to become brittle at low temperatures.

Surfa-SEALZ *increases road performance* by...

INCREASING SKID RESISTANCE! The bleeding of asphalt to the surface is one of the greatest causes of slippery highways. Surfa-SEALZ counteracts this tendency of asphalt to bleed.

REDUCING STRIPPING! Surfa-SEALZ helps prevent the penetration of water which is responsible for separating the stone from the asphalt binder.

STRENGTHENING ADHESION! With its tenacious, flexible bond, Surfa-SEALZ strengthens the bond of asphalt to aggregate.

Rubber-bituminous concrete made with Surfa-SEALZ Pellets needs no special equipment to mix or lay. And Surfa-SEALZ® adds only about $2.00 to the cost of a ton of mix!

For longer life and better performance in the surface courses *you* lay, better get in touch with Naugatuck today.

Naugatuck Chemical

Division of United States Rubber Company

Naugatuck, Connecticut

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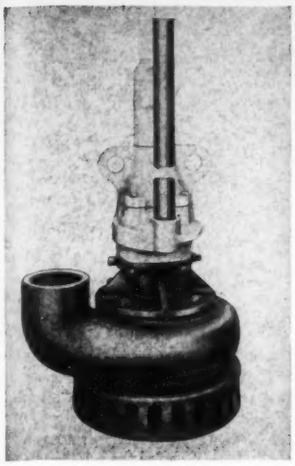
Help save a life by ordering a $10 CARE food package for delivery to a needy person overseas, or send a contribution, in any amount, to CARE, 660 First Avenue, New York 5, N. Y.



The new Byron Jackson Model BJ 2½-inch L pneumatic sump pump.

Pneumatic sump pump

■ A lightweight pneumatic sump pump that works from a 105 to 125 cfm air compressor has been announced by Byron Jackson Co., P.O. Box 2017, Terminal Annex, Los Angeles 54, Calif. The pump, which requires no priming, has an exhaust pipe that prevents muck and water from entering the motor. The length of this exhaust can be extended as required.

The BJ 2½-inch L pneumatic sponge pump is a vertical, single-stage, centrifugal unit driven by a rotary air motor that operates on compressed air at pressures ranging from 60 to 100 psi. Air consumption is 57 to 99 cubic feet per minute. The pump operates against heads of 7 to 76 cubic feet and offers capacities up to 380 gpm.

The rotary air motor is equipped with a governor and has a variable speed control. The impeller is a two-port non-clogging type, made of heat-treated Mechanite. A bronze wear ring adjusts to compensate for wear.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 534.

Aids for rebuilding worn tractor parts

■ Two new mailing pieces from Rankin Mfg. Co., 616 Marengo Ave., Alhambra 2, Calif., are designed as aids for rebuilding and hard-facing tractor parts.

Form A6-1 is a handy reference chart giving exact specifications for Caterpillar, International, and Allis-Chalmers tractor rollers and idlers. This sheet also gives step-by-step instructions for applying Ranite to all tractor and shovel parts. Ranite is a hard-facing electrode.

Form A-7 is a new cutaway template that can be used in measuring the wear of Caterpillar rails, sprockets, idlers, grousers, and rollers. The user cuts out the template that fits his tractor and superimposes it on the part to measure wear.

To obtain these mailing pieces write to the company, or use the Request Card that is bound in at page 18. Circle No. 535.

Tie-wire dispenser speeds reinforcing-bar tying

■ A tie-wire dispenser reel that speeds the tying of reinforcing steel, metal lath, and pipe insulation is made by Ideal Reel Co., 328 Harahan Blvd., Paducah, Ky. The Ideal reel fits on the worker's belt, placing the tie wire within convenient reach, while eliminating the conventional coil usually worn around the neck and shoulders. With openings on two sides, it can be used by either a left-handed or right-handed worker.

By dispensing wire as needed, the reel is reported to make it possible to complete 6 to 8 more ties per minute than with conventional tying methods. In part, this is due to the fact that wire does not have to be precut. The reel also eliminates all tie-wire waste.

A further advantage of the tie-wire reel is that it makes tying considerably safer for the worker.

The reel uses compact coils of 14 through 20-gage wire with a minimum weight of 3½ to 4 pounds. Other gages are also available.

For further information write to the company, or use the Request Card at page 18. Circle No. 536.

Attached to the worker's belt, the Ideal reel dispenses tie-wire conveniently and as needed.

THE BUFFALO-SPRINGFIELD K-45 KOMPACTOR

How to select compaction equipment

The logical question to ask yourself when you are ready to buy new compaction equipment is: "Exactly what do I need the equipment for and how will I use it?"

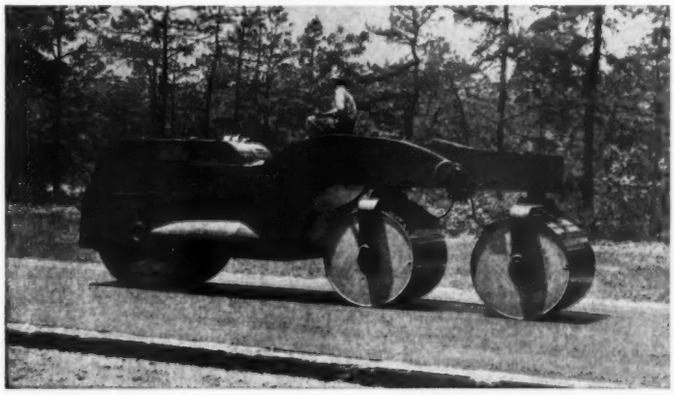
BASE FILL COMPACTION—This type of compaction demands equipment that will handle a wide variety of materials, give you the highest degree of compaction with the fewest passes. Buffalo-Springfield's revolutionary K-45 Kompactor is proving a real money-making answer for this type of work. It is self-propelled, relies on the "Interrupted Pressure Principle." All compaction effort is directed downward. Contractors testify they are meeting density requirements in one-fourth the time normally required with other compaction equipment.

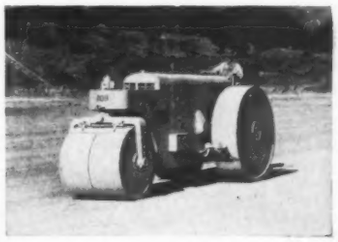
FINE GRADE FINISHING—Buffalo-Springfield offers six 3-wheel rollers, ranging in capacity from 5 to 15 tons, to handle the large variety of materials found in fills, subgrades and unfinished bituminous pavements. The variable-weight 3-wheel roller is ruggedly built for years and years of hard, maintenance-free work.

Buffalo-Springfield's thoroughly-proved 3-axle tandem "walking beam" roller provides up to 60% greater tonnage compacted per day in superhighway construction, airport and military establishment jobs where specifications are extra strict.

ASPHALT FINISHING—Two-axle Tandem Rollers are designed especially for all surface finishing jobs. Ranging from 5 to 16 tons, Buffalo-Springfield Tandems are used for

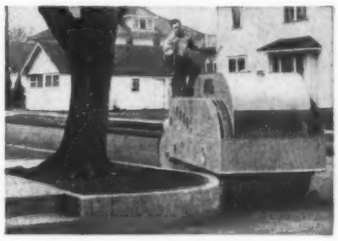
THE BUFFALO-SPRINGFIELD KX-3 AXLE TANDEM





3-WHEEL ROLLERS

heavy-duty highway and public works projects, and all types of finishing, maintenance and repair work. A wide selection of models for the biggest to the smallest jobs are designed for long-life and profitable operation.



TWO AXLE TANDEMS

SHORT ROLLING JOBS—Buffalo-Springfield's 3-5 ton portable roller is widely used for rolling driveways, sidewalks, parking and playground areas, and for patching and light finishing jobs. It is highly maneuverable and portable from job-to-job. Write today for full information on the type of equipment you need—or see your nearest distributor for an on-the-job demonstration.

3-5 TON PORTABLE TANDEM

The Standard of Comparison

BUFFALO SPRINGFIELD

SPRINGFIELD, OHIO

One man on this specially constructed rig directs a spray of grass seed and fertilizer over a berm along the Ohio Turnpike. The 3-inch hose, fed with material by a Deming portable centrifugal pump, also sprays lime and water in one operation.

Seed, fertilizer spread at one time by special rig

Using a specially constructed spreading rig, the H. M. H. Contracting Co., North Middletown, Ky., spreads seed and fertilizer in one operation along the Ohio Turnpike, covering an entire acre of berm in 15 minutes. Speed in this operation and the savings achieved in labor and money were matched by the high quality of the finished job, for the rig sowed steep fills and cuts that could not be landscaped by hand, and secured a more even distribution of seed and fertilizer by applying both simultaneously.

The spreading rig, mounted on a flat-bed truck, sprays the grass seed, fertilizer, lime, and water from a 1,000-gallon tank. Lime and water is applied by the rig in a separate operation. Each tank load covers one acre of ground when applied efficiently.

The mixtures are delivered to a 3-inch hose by a Deming portable centrifugal pump, and only one man is needed to direct the spray from platform on top of the tank as the truck moves along the highway. The 30-hp pump delivers the mix at a pressure of about 110 pounds, so that the spray covers an area up to 50 feet from the highway. If no pressure water supply is available, the contractor uses the pump to fill the tank. The rig was built for H. M. H. by Mitchell Powers, of Powers Roofing & Plumbing Co. located in North Middletown.

Reinforcing-bar tie wire available with dispenser

■ Its recently introduced Cal-Tie wire for tying reinforcing bars is now being marketed throughout the United States, according to the Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corp., 575 Madison Ave., New York, N. Y. Previously available in the West and only in limited quantities in the East, the wire is now being manufactured at the concern's Buffalo, N. Y., plant.

The packaged tie wire is marketed with handy reel dispensers that can be used by both right and left-handed workers. The dispensers are attached with belt fittings, and leave the worker's hands free for tying, carrying, or holding. Eliminating shoulder coils also means faster tying of inside forms, and freedom from wire kinking and tangling.

Both annealed and galvanized wire is available in gages 14 through 20. Each coil of wire weighs a minimum of 3½ pounds, and the lightweight reel dispenser weighs about 3 pounds.

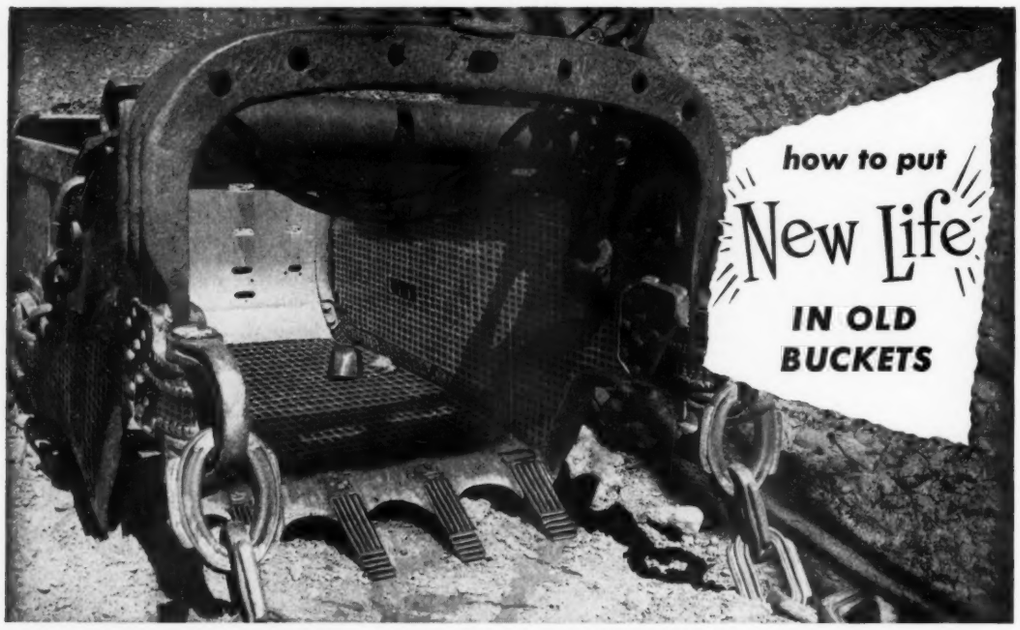
For further information write to the company, or use the Request Card at page 18. Circle No. 403.

Douglas fir hardboard for concrete forming

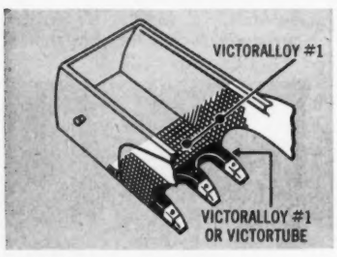
■ A new catalog giving specifications and application instructions for 19 different hardboard products is available from Forest Fiber Products Co., Box 68S, Forest Grove, Oreg. The detailed information given includes a description of each product, as well as data on physical properties, economic advantages, interior and exterior application procedure, and bending and finishing recommendations.

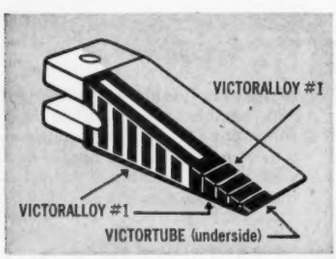
The standard Forest hardboard, made of Douglas fir fibers, is light tan in color and has a smooth surface on one side and a burlap texture on the other. Of other types available for specific building applications, one is recommended for concrete forming. This hardboard is given additional temper treating to withstand rough usage. It comes in 4×8-foot sizes in ¼ and 3/16-inch thicknesses.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 537.



USE VICTOR HARDFACING





Buckets . . . Apply VICTORALLOY #1 to top and bottom of bucket lips in overlapping beads. Protect other parts or areas showing wear with stringer beads of VICTORALLOY #1. Use 3/16" coated VICTORALLOY #1 at 170 to 190 amperes, a.c. or d.c., or ¼" at 200 to 225 amperes. If wear is unusually severe, substitute VICTORITE on bucket lips; use 3/16" coated at 120 to 150 amperes, a.c. or reverse-polarity d.c.

Teeth . . . Apply VICTORTUBE to underside from point upward about 2", and VICTORALLOY #1 to upper side of tooth same distance. Use stringer beads of VICTORALLOY #1 on balance of upper and lower surfaces, and on edges. Use 3/16" coated VICTORTUBE at 130 to 160 amperes, a.c. or reverse-polarity d.c., and 3/16" coated VICTORALLOY at 170 to 190 amperes, a.c. or d.c.

Why guess? . . . Select the right alloy from VICTOR's complete hardfacing line, made for both gas and manual or automatic arc application. New VICTOR illustrated hardfacing manual tells which alloys to use, how to apply. Ask your VICTOR dealer or write us today for your free copy.

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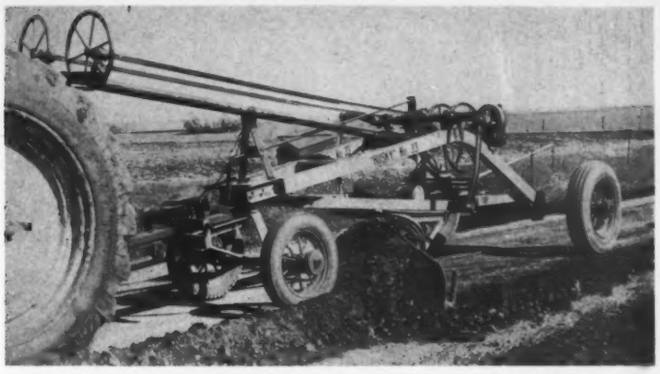
The Oliver OC-3 crawler tractor is shown laying gas pipe with the new Little Boomer sideboom.



THE HUSKY GRADER, manufactured for the past 40 years by Northfield Iron Co. is now being produced by Energy Farm Equipment Co., Monticello, Iowa. This concern has recently enlarged its plant facilities to accommodate the grader. Distribution will be handled through present outlets and through new representatives still to be selected. For further information write to the company, or use the Request Card at page 18. Circle No. 540.

Small sideboom handles light pipeline work

■ The Oliver OC-3 crawler tractor can now be equipped with a new small boom for light pipeline-handling work. The Little Boomer lifts loads of up to 1,600 pounds. It will lay and lower-in up to a 6-inch line and will carry single 48-foot lengths up to 12 inches in diameter. The tractor and boom combination weighs 5,205 pounds, and has been designed with a low center of gravity. For still greater stability with heavy loads, the Little Boomer can be equipped with automatic hydraulically operated counterbalance.

Load and boom lines operate off two hydraulically driven winches. The boom itself has only two controls and, according to the manufacturer, works so easily that an inexperienced man can learn to handle it in a few minutes.

Over-all dimensions of the Little Boomer and OC-3 tractor combination are: height, 84 inches; length, 101 inches; width, 66 inches; and boom length, 10 feet.

The Oliver tractor has 21.85 drawbar horsepower. Its steering mechanism is of the differential type that keeps power on both tracks at all times, enabling the operator to work up to the ditch without jerking or lurching. Also available for the OC-3 tractor is an 8,000-pound-capacity towing winch and a bulldozer-backfiller blade.

For further information write to the Oliver Corp., Dept. 3B, 400 W. Madison St., Chicago 6, Ill., or use the Request Card at page 18. Circle No. 409.

Economies offered by wrought-iron pipe

■ A yardstick for measuring basic cost factors in the installation of piping systems is contained in a new booklet from A. M. Byers Co., Clark Bldg., Pittsburgh 22, Pa.

The publication compares wrought-iron and other types of pipe in terms of the three important costs to consider in buying pipe: initial purchase, installation, and maintenance.

Several case histories of piping installations and a digest of the important uses for wrought-iron pipe in different types of industrial and municipal services are also included.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 454.

Crashing limestone—jolting road shocks, so they mounted the wheels on TIMKEN® bearings

45 tons of limestone come crashing into this big Easton tandem trailer, which then rides at high speeds over quarry roads to a cement plant.

All the jolting impacts are taken by the Timken® tapered roller bearings which support the wheels on the axles. And, rugged enough to take the heaviest shock loads, these bearings are also fine precision mechanisms.

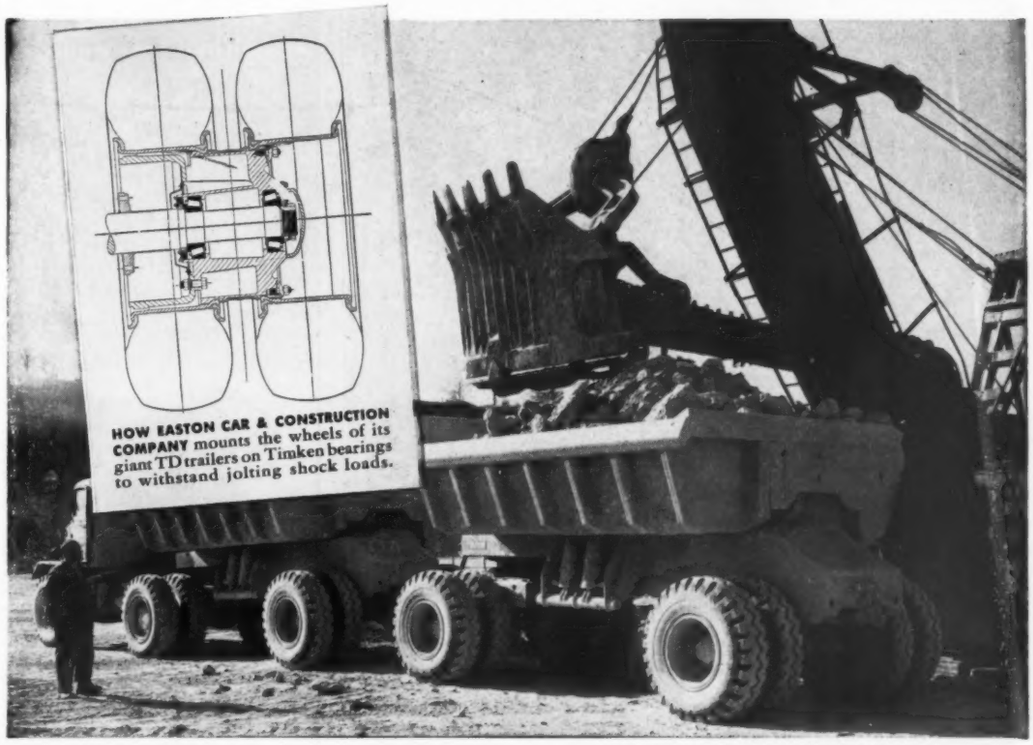
To get steel good enough for these bearings, we make our own—Timken fine alloy steel. To provide wear-resistant surfaces and shock-resistant cores, the bearings are case-carburized. They're tough on the inside, hard on the outside.

And Timken bearings have *inherently* high load capacity because the load is carried on a *full line contact* between rollers and races.

With these Easton trailers on the straight and level, the bearings withstand radial loads. But turning corners, the bearings also have to take sidewise *thrust* loads. The taper enables Timken bearings to take both radial AND thrust loads in any combination.

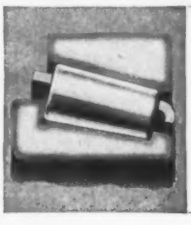
Timken bearings are a sure sign of quality on the equipment you buy—the equipment you build. Always look for the trade-mark "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



HOW EASTON CAR & CONSTRUCTION COMPANY mounts the wheels of its giant TD trailers on Timken bearings to withstand jolting shock loads.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

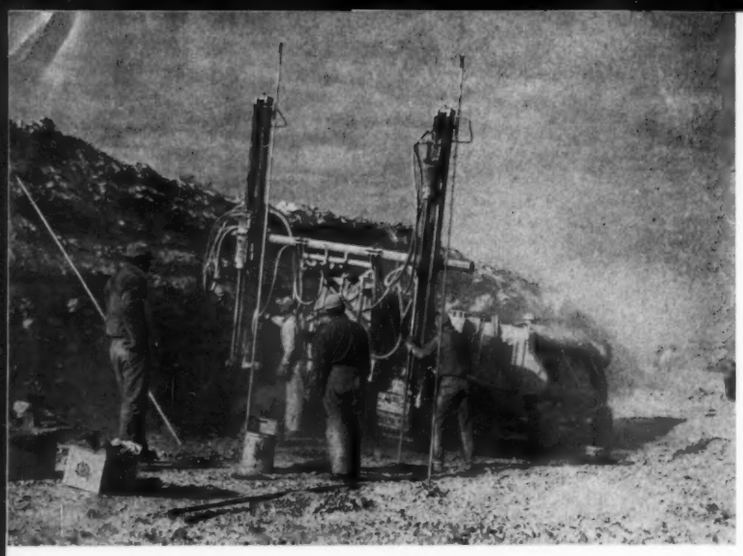


GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races. Timken bearings carry greater loads, hold shafts in line, wear longer.

Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. nickel-rich Timken alloy steels.

NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION



A pair of Gardner-Denver wagon drills, mounted on a dual-boom frame attached to a Caterpillar D7 tractor, bores holes for blasting in this section of rock cut along U. S. 80 in west Texas. A Gardner-Denver 600-cfm compressor furnishes air for the drills.

Ray Day Photos

Tough rock cut yields to analysis, big rigs

A little thought and planning beforehand prevented field difficulties on this rocky stretch of highway

Rhyolite, a fine-grained granite-like rock, is probably the toughest material a contractor can find to work with in Texas. Take a quantity of more than 350,000 cubic yards of the stuff, put it directly in the path of a 9½-mile section of highway—and you have a real challenge for road-building crews.

Hugh McMillan, El Paso, Texas, contractor, faced this situation on a stretch of U. S. 80 just west of Van Horn. Under a $570,000 contract to straighten the kinks in the highway, McMillan's crews had to cut through hard-bedded rhyolite which forms the base for the foothills of a nearby mountain range.

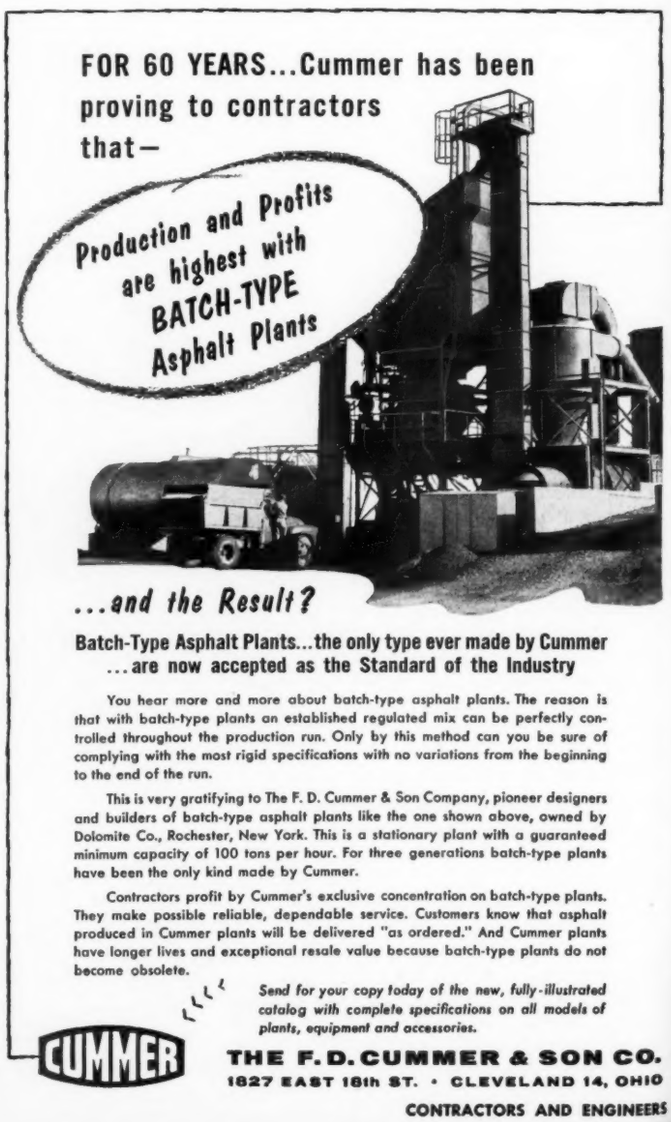
Despite these natural handicaps, McMillan's management and general superintendent Albert Bruner worked out a highly successful drilling and explosives procedure in the rhyolite. It's not that the rock was softer than anticipated; in actual drilling, ordinary rock bits burned up in 4 inches of travel. It's just that McMillan analyzed the difficulty, set himself up for a really difficult rock job, and proceeded on or slightly ahead of schedule. Just 300 working days from November 15, 1954, the 600,000-cubic-yard job — including 361,000 cubic yards of rock—must be finished, along with the necessary subbase and a penetration asphalt treatment.

The first step was a correct analysis of the rock formation. At this point, the rock is bedded, somewhat seamed, and extremely hard. Shaken by explosives, the formation tends to break into small cubes, which get progressively smaller until cubical particles almost the size of dust are produced. Because of this tendency on the part of the rock, the contractor decided he could handle a considerable portion of the rock hauling with scrapers.

Tricky drilling

Drilling was anything but easy. To

IN EASTLAKE, OHIO...
Powerhouse
Cleveland Electric
Illuminating Co.
Steel Fabricated by Ingalls
Fabricating Steel is our Business
THE INGALLS IRON WORKS COMPANY
BIRMINGHAM, ALA. • PITTSBURGH, PA.
SALES OFFICES: Birmingham, New York, Chicago, Pittsburgh, Houston, New Orleans, Atlanta


FOR 60 YEARS...Cummer has been proving to contractors that—
Production and Profits are highest with BATCH-TYPE Asphalt Plants
...and the Result?
Batch-Type Asphalt Plants...the only type ever made by Cummer ...are now accepted as the Standard of the Industry
You hear more and more about batch-type asphalt plants. The reason is that with batch-type plants an established regulated mix can be perfectly controlled throughout the production run. Only by this method can you be sure of complying with the most rigid specifications with no variations from the beginning to the end of the run.
This is very gratifying to The F. D. Cummer & Son Company, pioneer designers and builders of batch-type asphalt plants like the one shown above, owned by Dolomite Co., Rochester, New York. This is a stationary plant with a guaranteed minimum capacity of 100 tons per hour. For three generations batch-type plants have been the only kind made by Cummer.
Contractors profit by Cummer's exclusive concentration on batch-type plants. They make possible reliable, dependable service. Customers know that asphalt produced in Cummer plants will be delivered "as ordered." And Cummer plants have longer lives and exceptional resale value because batch-type plants do not become obsolete.
Send for your copy today of the new, fully-illustrated catalog with complete specifications on all models of plants, equipment and accessories.
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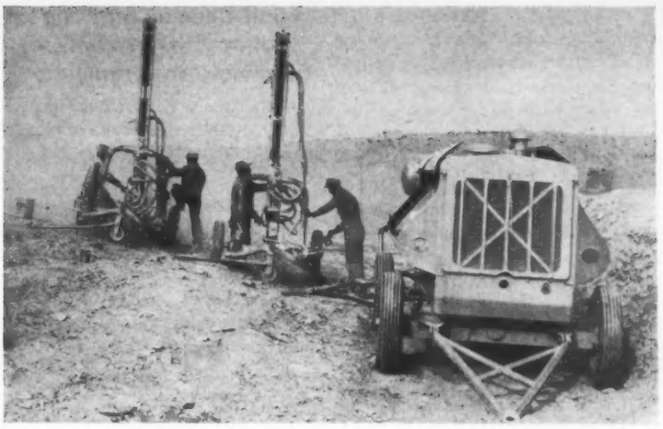
THE F. D. CUMMER & SON CO.
1827 EAST 18th ST. • CLEVELAND 14, OHIO

Albert Bruner (left) discusses rock shooting in the cut with his power man, L. B. Robuck.



In another section of the cut, Gardner-Denver wagon drills furnished with air by a 600-cfm compressor prepare the area for blasting.

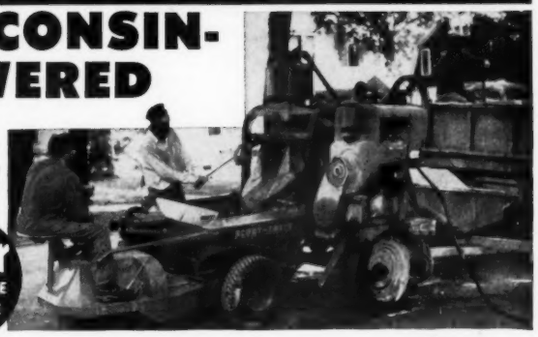
get best results, McMillan used a Gardner-Denver 600-cfm compressor for every two Gardner-Denver wagon drills. The contractor had eight Gardner-Denver wagon drills on the job. Four were conventionally mounted machines, and four were mounted on dual-boom frames attached to Caterpillar tractors. Handling Gardner-Denver drill steel up to 20 feet long, as well as Timken tungsten-carbide bits, these rigs did the trick. In spite of the extremely abrasive nature of the rhyolite, tungsten-carbide bits of 1⅞-inch diameter lasted about 100 linear feet between sharpenings. However, since four to five sharpenings are the limit for these bits, it still amounted to expensive drilling.

The hole pattern started off on the basis of an 8-foot-square grid, but that had to be changed to an 8 × 7-foot pattern. Since the formation refuses to spring very well, the original pattern was too wide for column loading unless the powder was loaded dangerously close to the ground surface. Powder had to be covered with heavy stemming to prevent excessive throw. The 8 × 7-foot pattern, particularly on 18 to 20-foot drilling, worked very well. Slightly more than one-half a pound of powder per cubic yard fractured the rhyolite so that scrapers could pick it up.

The entire center section of the excavation prism was blasted open instantaneously with electric caps, while the ¼ to 1 sideslopes in rock were close-drilled and delayed with Western Minimax No. 1 delays, so that the slopes could break out after the main shot had exploded. This helped maintenance crews later on, because excessive use of explosives close to the slope lines would have aggravated the tendency of this rock formation to ravel badly after being broken open. Apache No. 3 bag powder, rated at 40 per cent, was used in the blasting.

By early spring, the 44-foot-wide

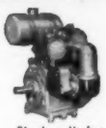
POWER to MIX Concrete and DELIVER it...BOTH UNITS ARE WISCONSIN-POWERED

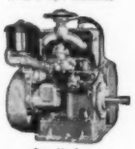


Working here are two fine units powered by Wisconsin Heavy-Duty Air-Cooled Engines . . . the versatile "Scoot-Crete" made by Getman Brothers, Manufacturing Div., South Haven, Mich., and the Kwik-Mix Dandy, built by Kwik-Mix Co., Koehring subsidiary, Port Washington, Wis. Both of these units have the inbuilt stamina and Lugging Power that are Wisconsin Engine characteristics . . . insured by such features as:

Heavy-duty engineered design and construction in all details; self-cleaning, file-hard tapered roller bearings at BOTH ends of the crankshaft; an easily accessible rotary type, high tension OUTSIDE Magneto, equipped with Impulse Coupling for quick starts in any weather, at low cranking speeds; pump circulated splash lubrication on smaller models and geared oil pump delivering individual oil stream to each rod on multi-cylinder models, *plus* efficient AIR-COOLING at temperatures from sub-zero to 140° F.

All this adds up to efficient Power Performance, Long Engine Life and Low-Cost Maintenance . . . reasons why *you* can't do better than to specify "Wisconsin Power" for *your* equipment.


Single-cylinder 3 to 9 hp. models.


2-cylinder 7 to 15 hp. models.

V-type 4-cylinder 15 to 36 hp. models.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

A 8362-½I.A

FACTORY TO YOU

No middleman involved when you buy a McCarter Asphalt Plant.

This factory-to-you plan guarantees you the most for your money in equipment . . . the most satisfactory service.

Designed by our own engineers, built in our own factory, serviced directly by our factory experts.

Our sales engineers will be glad to counsel with you.

REPAIRS AND MODERNIZING

We specialize in remodeling old plants for better production and more efficient operation.

Mc McCARTER IRON WORKS, INC. NORRISTOWN, PA.

(bottom width) roadway was largely shaped up. Four LeTourneau scrapers and Caterpillar tractors moved the blasted rock. When the blasting of 20-foot lifts began, the scraper fleet was augmented by a new Northwest 80-D, carrying an Amsco 2½-cubic-yard dipper and a fleet of Koehring Dumptors. Quantities were balanced and hauling presented no problem.

Had this rare heavy-rock job not been correctly analyzed in its early stages, however, it could have presented innumerable field difficulties.

THE END

New hard-facing alloy

■ A low-hydrogen hard-facing alloy for application to working surfaces of aggregate-handling equipment and construction machinery requiring impact and wear resistance is now available from Wall Colmonoy Corp., 19345 John R St., Detroit 3, Mich.

The new iron-base chrome-molybdenum-silicon alloy, known as Colmonoy No. 2, is offered in the form of ac-dc electrodes for use on manganese and other steels. It can be used on such equipment components as tractor treads, dipper teeth, ditcher teeth, scraper knives, truck beds, dragline buckets, scraper blades, snowplow blades, driving spindles, shovel-boom sockets, car couplers, pinion wobblers, and asphalt-mill liners. Colmonoy No. 2 is not recommended for applications requiring heavy build-up where crack-free deposits are demanded.

As deposited, Colmonoy No. 2 has a Rockwell hardness of 50–55 on the C scale following the first pass and 55–60 after the second pass. Tensile strength is about 75,000 psi and specific gravity is 7.6.

Colmonoy No. 2 is available in ⅛, 5/32, 3/16, and ¼-inch-diameter electrodes, packed in 10-pound metal containers.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 419.

Dill has executive post at U. S. Steel division

The new post of assistant to the vice president for engineering, research, and development for the American Bridge Division of U. S. Steel Corp., New York, N. Y. has been filled by Frederick H. Dill. He will coordinate research and development throughout the division.

Mr. Dill received his master of science degree in civil engineering from Rutgers University. He began with American Bridge as a draftsman at the Ambridge, Pa., plant in 1929, and became test engineer in the mechanical engineering department ten years later. He was appointed welding engineer in 1941, and he held the post until his present appointment.

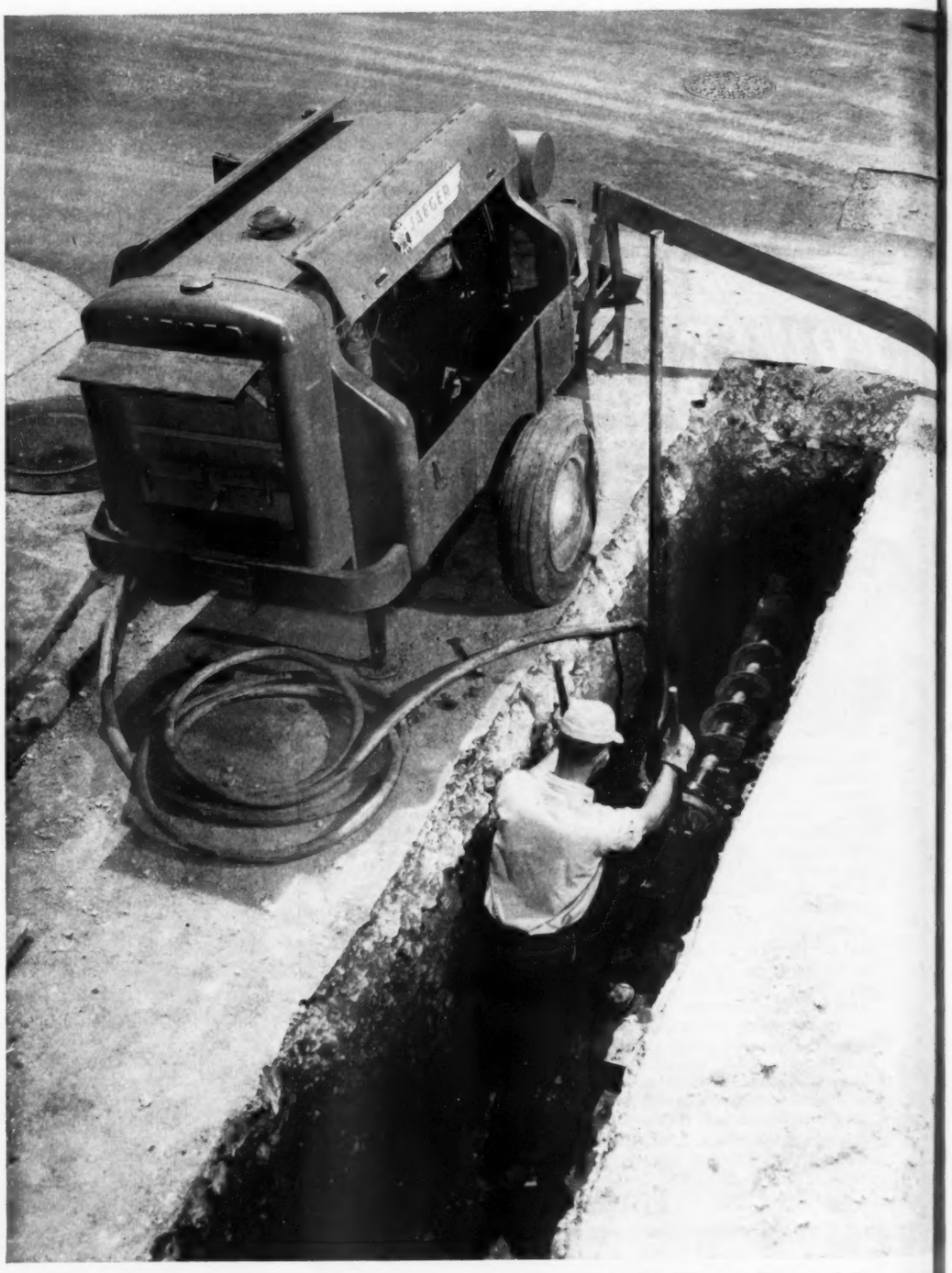
He is a member of the American Society of Civil Engineers, American Welding Society, American Society for Metals, and American Society for Testing Materials.

Land-clearing machine that uproots heavy trees can work in swamps

■ The Tree Crasher, a huge new R. G. LeTourneau land-clearing machine weighing 120,000 pounds, has the power to uproot heavy trees and to clear all underbrush in its path. But, riding on six tires that are each 10 feet tall and 4 feet wide, the machine exerts about as much pressure per square inch of ground contact as does a walking man. This exceptional flotation makes the Tree Crasher particularly well suited for work in swampy or sandy areas.

On such terrain, the machine also has the traction advantages provided by the LeTourneau Electric Wheel method of locomotion. This system powers each wheel independently of the others, so that should some of the wheels lose their footing, the machine continues to have traction through the wheels retaining ground contact. Each of the six wheels has within its rim an individual electric motor and gear reduction. These motors are driven by generators which, in turn, are driven by two big diesel engines near the center of the unit.

The mammoth machine was designed and built with these special



FULL SPEED AHEAD, AT AN EASY 1400 RPM: To provide the 110 cfm of 100 lb. air needed to run this 5 hp. Ka-Mo drill at top efficiency, the Jaeger "125" Roto never had to run faster than 1400 rpm. You save fuel, you save wear and tear on your engine and compressor because Jaeger high efficiency does the job at lower speed.

Resembling a rubber-tire flatcar, except for the fact that it is much larger, the Tree Crasher, made by R. G. LeTourneau, Inc., has its own power and flotation to travel over any terrain, clearing the growth including large trees. Compare the size of the vehicle with the operator leaning out of the cab to receive instructions from the president of the firm, R. G. LeTourneau, in the foreground.

characteristics for Handley Construction Co., of Pahokee, Fla., to do major land-clearing work along the Florida-Georgia line.

When the machine is in operation, the operator is perched in a balcony-high cab. Fingering trigger-sensitive switches, he maneuvers the Tree Crasher directly into a large tree with the blade raised about 10 feet in the air. The tree bends, strains, and then lifts its own roots as it crashes to the ground. For smaller medium-size trees, the machine goes in with its blade lowered, uprooting and carrying away trees and underbrush in one continuous operation.

Another application expected to develop for the machine is that of transporting heavy loads over rough terrain. The top of the Tree Crasher forms a convenient platform 39 feet long and 11 feet wide. According to R. G. LeTourneau engineers, this platform is capable of supporting more than 200,000 pounds.

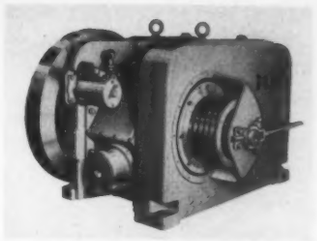
For further information write to R. G. LeTourneau, Inc., 2399 S. MacArthur, Longview, Texas, or use the Request Card at page 18. Circle No. 468.

Weed-control chemicals

■ The Chipman line of weed-control chemical sprays is described in a booklet available on request. Both selective and nonselective sprays are listed.

The booklet describes the uses of and application methods for several types of weed killers. Among these are chlorates, 2,4-D and 2,4,5-T, Methoxone, IPC and CIPC, arsenical, dinitro, and TCA weed killers.

To obtain this literature write to Chipman Chemical Co., 44 Factory Lane, Bound Brook, N. J., or use the card at page 18. Circle No. 450.



The new 20-hp Minneapolis-Moline Timeline 168 power unit has been designed to operate with once-a-year servicing.

Engine expected to run one year without service

■ A radically new engine designed to run continuously for a year without service has been announced by Minneapolis-Moline Co., Box 1050, Minneapolis 1, Minn. The 2-cylinder MM Timeline 168 engine, now in production, is rated at 20 horsepower at 1,200 rpm. Bore is 4⅜ inches and stroke is 5 inches, with a piston displacement of 168 cubic inches.

A new radial cooling system has replaced the conventional radiator in this engine. Also eliminated are water pump, pulleys, fan, fan belt, and radiator hoses. Water is circulated through a cast-aluminum cooling unit built into the flywheel.

Minneapolis-Moline reports that a number of these long-running MM Timeline power units have been operating continuously, without service of any kind, for 24 hours a day in oil field pumping installations. Reports from these locations indicate these engines have been in operation at least a year without any service. At the end of a year, say MM engineers, only normal preventive maintenance is needed.

Present models use natural gas fuel, but future production of units for LP gas is anticipated. Models planned are 15 and 26-hp units.

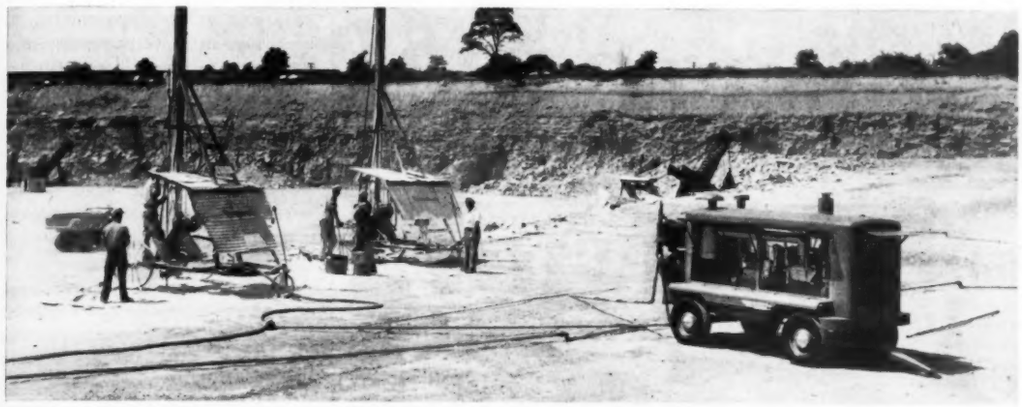
For further information write to the company, or use the Request Card at page 18. Circle No. 433.

Grid guide lines on paper disappear in blueprints

■ A drawing and tracing paper with disappearing grid lines is now available in rolls from Clearprint Paper Co., Dept. F7, 1482 67th St., Emeryville, Calif. This paper is printed with light blue cross-section rulings which serve as drawing and lettering guides, but which disappear completely on direct-print reproductions and blueprints.

The fade-out grid paper is recommended for such applications as structural, architectural, and schematic drawings; plant layouts; surveyors' plottings; and mapping. It is available in 20, 50, and 100-yard rolls in widths of 24 to 42 inches. The paper is supplied in 16 and 20-pound stock with grid lines printed 8×8 or 10×10 to the inch, and with heavy inch lines. In addition to the rolls, fade-out paper is also available in sheets up to 42 inches wide and in 8½×11-inch pads.

For further information write to the company, or use the Request Card at page 18. Circle No. 421.



DRILLING UP TO 80′ PER HOUR IN HARD LIMESTONE, ON ONLY 7 GALLONS OF FUEL: These two quarry rigs, with 4″ drills and air tugger hoists, averaged 700′ to 800′ per 10-hour day drilling 19′ holes of 3″ final diameter in hard flux limestone. In more than 2000 hours of six-days-a-week operation, the Jaeger "600" Roto compressor averaged only 7 gallons of fuel per hour, because it never had to run faster than 1600 rpm.

Jaeger Roto air-plus

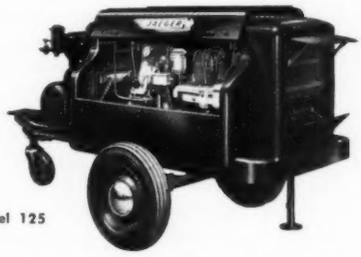
the first fully efficient rotary compressor has been proved on every kind of job

Since early 1954 Jaeger Roto compressors have logged thousands of hours on every kind of work from breaking pavement to operating heavy pile hammers.

In both the "125" and "600" models, two performance characteristics have been outstanding:

1. Higher efficiency, inherent in the Jaeger Roto design, enables these compressors to produce equal air volume at slower operating speeds than any other rotaries. As a result, they have the lowest fuel consumption and longest life of any rotary compressors on the market.

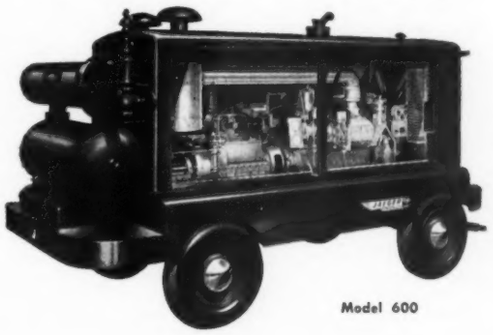
2. Air delivery is so instantaneous and so closely regulated to demand that 100 lbs. minimum pressure is maintained under all normal operation — *as smooth as steam.* Speed modulation is smooth and stepless over the entire operating range and so instant acting as to prevent any over-run and racing of engine. Controls are also simple, without complex linkage or toggles, or metering orifices.



Model 125

More efficient cooling, the elimination of cold weather "dry starts", closer control of engine water temperature, 8-hour fuel tanks and many other valuable Jaeger advantages are also offered in both the "125" and "600" cfm models of the Roto Air-Plus compressor.

For complete information, see your Jaeger distributor or send for Catalog JCR-5. For air users who still prefer the piston type, Jaeger Air Plus reciprocating compressors continue to be available in the Jaeger "new standard" ratings with the exception of the "600" size.



Model 600

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

PUMPS • LOADERS • MIXERS
TRUCK MIXERS • PAVING MACHINES

A Gar-Bro 4-yard concrete bucket unloads into deck forms. Slabs are 5½ inches thick and have 3-foot-high monolithic stringers. *Ray Day Photo*

Similar units in bridg ow

With three designs available for constructing the 5,897-foot bridge across the Pend Oreille River near Sandpoint, Idaho, a joint-venture firm selected one calling for 26 virtually identical units to secure the advantages of simplicity and economy.

Started last April by Peter Kiewit Sons' Co., Longview, Wash., and Le Boeuf-Dougherty Contracting Co., Richmond, Calif., the new structure and south approach are being built at a $54,463 saving. The bridge, scheduled for completion in September, will carry principal north-south traffic on U. S. 95, replacing an obsolete wood pile and timber deck span.

The precast bridge deck, measuring 28 feet curb-to-curb and 30 feet between the face of guardrails, has slabs 5½ inches thick which contain five monolithic stringers 3 feet high. These taper in width from 10 inches at the top to 8½ inches at the bottom. Each slab weighs approximately 73 tons. The alternate plans discarded by the contractors called either for pouring the stringers monolithically and separate from the deck, or for splitting the deck section longitudinally into 64 sections of different shapes.

The design for the bridge was made only after careful probing of the Pend Oreille river bottom and sampling of the riverbed with a unique adaptation of the vane-boring method originally adopted by Swedish engineers. (See "Vane Borer Used in Bridge Cost Study", C&E, Oct., 1953, pg. 13.) Work on the 26 similar units, numbered from south to north, started on the Sandpoint side and edged toward the south shore. Each unit consists of six 35-foot spans and one 17-foot braced tower span which serves as a stiffening member in every unit.

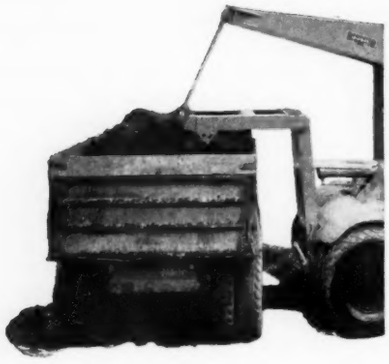
Units 1 through 9 consist of Basalt Rock Co. 14-inch-diameter welded pile shells about 76 feet long, driven 5 piles to a bent and filled with concrete. Units 10 through 12 are 6-pile bents of composite design. The lower portion of the bents is formed by timber piles of various lengths, driven to bearing and topped by a 38-foot shell extension reaching 10 feet below the riverbed. Units 13 through 26 are 7-pile bents of 90-foot timber piles, located under the 38-foot concrete-filled steel shells. These have bearing values based on six 45-ton pile-loading tests made in this section of the river before pile driving was started.

A cast-in-place reinforced-concrete cap 24 inches square and with neatly chamfered edges, tops the pile bents. Anchor bolts and steel clips on this poured-in-place beam guide precast deck slabs into position and anchor them. At the middle bent between the braced tower spans is a 1½-inch expansion joint, and at the end of each precast panel is a ½-inch fixed joint filled with hot-poured rubber compound. The sides of each slab will carry WF15 vertical steel guardrail posts and a No. 10 U. S. gage corrugated plate guardrail.

An 80-foot span in Unit 3—the only exception in the almost uniform design—is a navigation span with a reinforced-concrete deck carried by

GET TRUCK PAYLOADS!

with the DEMPSTER DIGGSTER® GRD-101



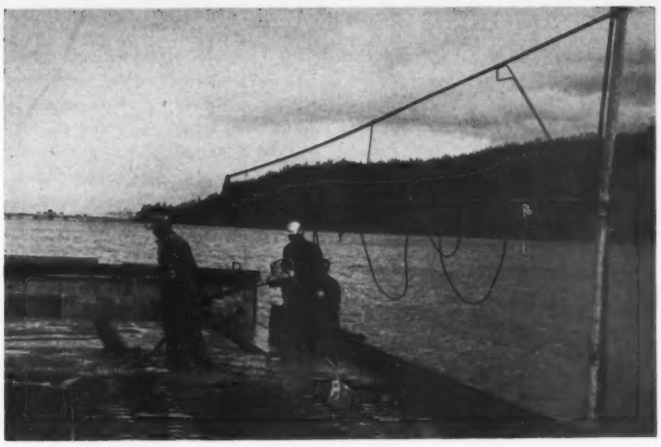
The two photos above show some very important advantages you get when you use a Dempster-Diggster GRD-101. Photo directly above shows you why you have no truck shock with a Dempster-Diggster. You can lay bucket in truck body, trip latch and pull bucket up off load. Photo at right above shows you why you get a truck payload with a Dempster-Diggster . . . and how natural and easy it is to do so. This truck is now loaded to maximum heaped capacity, yet Dempster-Diggster has ample clearance. The dumping height is 9'6" and the digging height is approximately 15 feet. This enables the Dempster-Diggster to work with high dump equipment.

Other very important features of the new Dempster-Diggster GRD-101 include: AN EXCAVATOR THAT NEEDS NO WHEEL TRACTION (loading of bucket is accomplished by the exclusive Hydraulic Crowd and Hoist Action of the Dempster-Diggster) . . . TRUCK-SPEED MOBILITY TO AND FROM JOBS . . . AUTOMATIC BUCKET TRIP . . . MINIMUM TURNING RADIUS . . . THE SHOVEL WITH TORQUE CONVERTER . . . HYDRAULIC STEERING. Here's a shovel that gives you extra speed on the job and to and from jobs that means extra profits to you! Pound for pound, dollar for dollar, the Dempster-Diggster GRD-101 will out-dig and out-load any other available competing machine in tough going! Let us prove that statement! Write for complete information. Manufactured by Dempster Brothers, Inc.

DEMPSTER BROTHERS

DEMPSTER BROTHERS, 484 Shea Bldg., Knoxville 17, Tennessee

...ower precasting costs



As concrete is dumped, it is vibrated by Viber electric units mounted on a boom at the side of the trestle.

five 36-inch WF230 steel girders. Earth embankment approaches are being located at both ends of the bridge. The south embankment is a small rolled-earth approach, but the Sandpoint approach calls for 530,000 cubic yards of hydraulically dredged material to be placed.

All steel-shell piles for the substructure were shipped to a Sandpoint railroad siding, brought to the river by a trucking subcontractor, and carried to the pile driver on large rafts. About half the timber piling furnished by L. D. McFarland Co., Sandpoint, was shipped in from the West coast, and the remainder was cut locally.

The driver's steel hull had pontoon sections like those used by U. S. Army Engineers during World War II, and its steel leads, rising 115 feet above the surface of the water, were built in a steel fabricating shop in Boise and shipped to the site by rail. Mounted on the deck was a 40-hp vertical steam boiler, four-drum Clyde hoist driven by a Buda engine, and Washington three-drum hoist.

Driving was done by a Vulcan No. 1 single-acting pile hammer, which was strengthened with a 6,500-pound ram for difficult work in the stiff plastic clay of the riverbed. This heavier ram was substituted when the driver was achieving apparent penetrations of 1½ inches per blow, but net penetrations of only ¼ and ⅛ inch because of rebound action. With the new ram, between 20 and 30 piles was considered average for 8 hours of driving.

At the contractor's suggestion, a field joint was used to splice the steel-shell piles to the wood piling under the riverbed. This device consisted of conical-type welded steel fingers which trained 30-inch-long steel-pile shells tightly over the wood pile butt. The 30-inch-long connector piece fastened to the 38-foot upper shell with flush edges. Welded stiffeners were placed on the outside by a Hobart electric welding machine located on the deck of the driver.

When a shop-fabricated shell-pile extension with ¾-inch divider plate, 30-inch spliced section, stiffener bars, and conical cutting edge was delivered to the field, the butt of a timber pile was trimmed to fit into the hammer, and the shell pile trimmed to grade. The conical cutting edge of the extension took in more than 14 inches of material, compressed it, then allowed it to expand to the inside diameter of the shell. The ¾-inch cross plate provided a stop for the timber pile, and assured that the shell would be dry when it was filled with concrete.

The pile driver, positioned for each bent by crossed bow and stern anchor lines operated from the drums of deck winches, drove each bent by backing off the required distance and positioning each pile according to survey lines maintained by state engineers. As each bent was finished, heavy temporary brace timbers were installed just below the reinforced-concrete pile cap so that pile heads lined up perfectly. The cap was then poured in 11 sets of steel forms.

(Continued on next page)

Small Crew Installs Guardrail *FAST*

Contractors find Armco FLEX-BEAM Guardrail* easy to install even with a three-man crew. All you need are rail sections, posts and bolts. No springs, deadmen or castings are required. Curves are as easy to install as straight runs because there is no stretching and posts stay in perfect alignment. Individual sections can be pre-curved to a minimum radius of 20 feet.

Armco FLEX-BEAM Guardrail works well with practically any type of post. It can be installed on wood, concrete or metal posts of any shape.

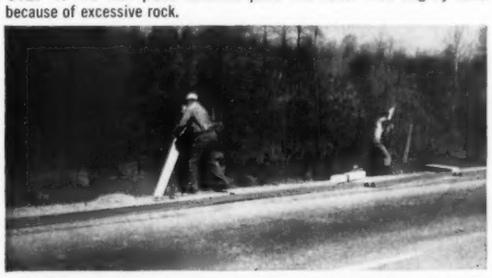
It is widely used along the nation's most important highways, expressways and toll roads. You'll also find it economical and efficient for secondary roads, dead-end street protection, municipal or industrial parking lots. FLEX-BEAM Bridge Rail provides all the features of highway guardrail plus many special advantages.

CONSTRUCTION SERVICE. Contractors primarily interested in other phases of construction jobs often find that guardrail is part of the contract. Armco Construction Department can handle the guardrail part of the work and give you the protection of a fixed bid.

Write for data on FLEX-BEAM Guardrail, Bridge Rail, or Construction Service. Armco Drainage & Metal Products, Inc., 4715 Curtis St., Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

*Armco FLEX-BEAM Guardrail is a deeply corrugated, beam-type rail supplied in 10- or 12-gage steel. For mounting on posts on 12'-6" centers. Spliced by seven bolts. Flare-back end wing. Painted after installation.

STEP 1: Two men place concrete post. The holes were dug by hand because of excessive rock.



STEP 2: Men lift an Armco FLEX-BEAM section to be fastened loosely to posts by long center bolts.

STEP 3: Crew plumbs posts and levels the Armco Guardrail in preparation for tamping earth around posts.

ARMCO®

ARMCO FLEX-BEAM GUARDRAIL

STEP 4: Tamping earth around post. Bolts will be placed and tightened in splice at left as work progresses.

STEP 5: Installation completed. Next, the FLEX-BEAM Guardrail will be painted for appearance and reflectivity.

(Continued from preceding page)

The considerable amount of hoisting work over water, which included placement of all pile filler concrete as well as concrete in the pile caps, was done by the Swoose, a small mobile floating rig built specially for pouring and stripping of cap forms, stripping of pile bracing, and installing of permanent bracing at the tower sections. Equipped with an International-powered hoist, this rig makes lifts of about eight tons.

Precasting deck sections

Deck sections, precast under a subcontract by Seattle Concrete Pipe Co. Inc., Seattle, Wash., are being formed in a casting yard situated on a trestle which extends into the river from the south shore. This yard accommodates four precasting bays for the 35-foot sections and one bay for the 17-foot sections, and has room enough for the prefabrication of steel reinforcing in timber jibs. After the latter are tied, they are picked up by the P&H 5-ton gantry-mounted crane.

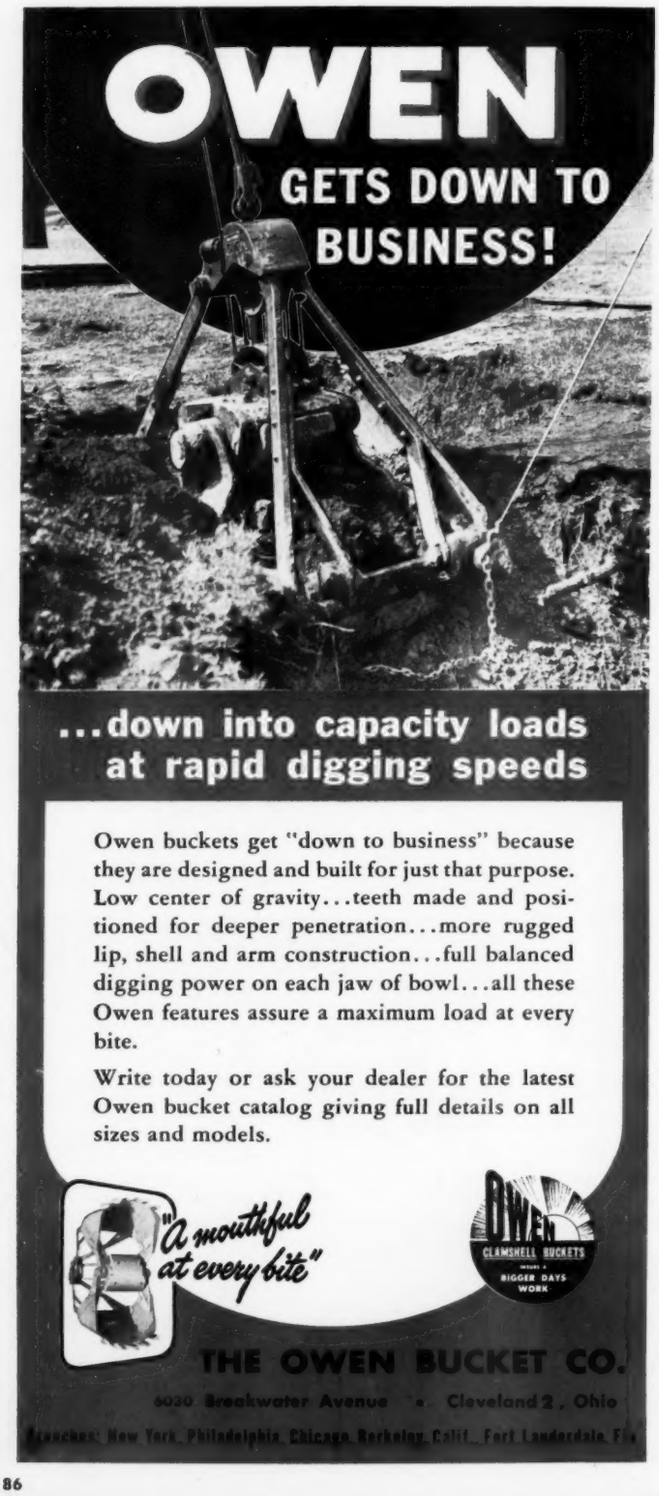
Prefabricated and pre-tied steel reinforcing is set in steel pan-type forms supported by the trestle falsework as each section is made ready for a pour. The six-sack concrete mix, which yields a compressive strength of 3,000 pounds at 3 days, is brought to the site in Challenge 3-yard truck mixers by a commercial firm. The truck mixers dump to a Gar-Bro bucket carried by the gantry-mounted overhead crane, and side-boom-mounted Viber electric vibrators consolidate the mix in the forms. Stringers are generally poured before concrete is placed in the deck section proper. After the deck concrete is vibrated by a surface screed, a cross-type steel broom finish is applied.

Precast deck sections are then cured by live steam at a maximum temperature of 130 degrees F while under protection of a plywood housing for 72 hours. This cure develops high early strength without the use of special cement. High-early-strength cement was used only in the reinforced-concrete caps.

When concrete reaches a compressive strength of 3,000 pounds, slabs are fastened securely at several points to a structural-steel pickup device. A small 100-ton floating crane, also built at the site, lifts the section out of the steel forms. This crane has two 8-foot-diameter steel pontoons, each 60 feet long, tied together by welded pipe sections. Its heavy steel A-frame with horizontal jib is capable of picking up about 100 tons, and it carries a Buda-powered Skagit hoist which makes the actual lifts. The derrick, towed to the bridge by a 100-hp tug, carries each precast deck section on a large multiple hook.

Dredging for embankment

Construction of the 530,000-yard embankment on the Sandpoint end of the bridge is being done through a separate contract with H. G. Palmberg, Astoria, Oreg. Palmberg is using a 12-inch 750-hp dredge, the Mole, to dig about 22 feet below water surface for the material. At this depth a bank


OWEN
GETS DOWN TO BUSINESS!
...down into capacity loads at rapid digging speeds
Owen buckets get "down to business" because they are designed and built for just that purpose. Low center of gravity...teeth made and positioned for deeper penetration...more rugged lip, shell and arm construction...full balanced digging power on each jaw of bowl...all these Owen features assure a maximum load at every bite.
Write today or ask your dealer for the latest Owen bucket catalog giving full details on all sizes and models.
"A mouthful at every bite"
OWEN CLAMSHELL BUCKETS
THE OWEN BUCKET CO.
6030 Breakwater Avenue • Cleveland 2, Ohio

THE IMMENSITY of the Los Angeles County Sewer system project is accentuated by comparison of workmen with 144 inch diameter concrete pipe.

Vibration Important Feature in Production of 144 Inch Concrete Pipe

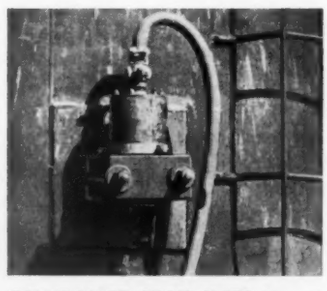
• **Los Angeles installation**—The expansion of facilities of the County Sanitation Districts of Los Angeles necessitated installation of 7800 feet of 12 foot diameter reinforced concrete pipe. The pipe is 12 feet in length with tongue and groove joints and with a shell thickness of 12 inches. The pipe sections weigh about 39 tons per length.

• **Manufactured at plant**—Reinforcing consisted of a double cage, one of which was elliptical in shape. Cages were manufactured at the plant site and the circumferential reinforcement welded to the longitudinal bars. The cages were dropped over the inner form and held in place by appropriate spars. The outer form was then placed, and the job was poured in the usual manner.

• **Tests made**—United Concrete Pipe Corporation used three Model PX Vibrators on steel forms specially constructed to eliminate leakage of grout or water. Tests made of concrete in these pipes show high strengths, as much as 7000 pounds per square inch not being uncommon.

• **An interesting manual**—on "How to Apply, Operate and Maintain EXTERNAL VIBRATORS in the MANUFACTURE of CONCRETE PIPE" can be obtained by writing Viber Company, Burbank, California.

• **For further information**—on Viber's complete line of internal and external vibrators, contact your authorized distributor, or Viber Company, Dept. 76, 726 South Flower Street, Burbank, California.



CONTROLLED HIGH SPEED external vibration with Viber Model PX vibrator produces smoother finished surface inside and out. High strengths obtained in this pipe would have been impossible without vibration.

VIBER CO.
CONCRETE VIBRATORS SINCE 1931

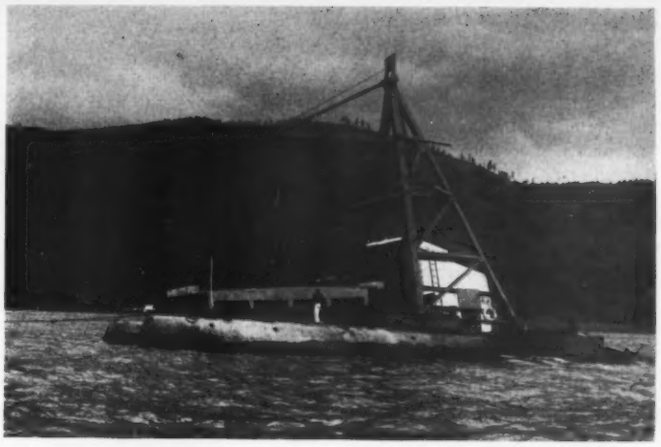
of about eight feet is being removed at about 7,000 cubic yards daily.

All the sandy river-bottom material passes a No. 4-mesh screen, and about 90 per cent passes the No. 10. The borrow-pit material has to be pumped a distance of about 1,000 to 1,500 feet to the fill. Below the water surface, the material forms an angle of about 2½ to 1 or 3 to 1. Above-water slopes of 20 to 1 are being obtained without the aid of batter-board devices.

Riprap placed last winter when the lake was at a low water stage protects the embankment from wave action, and side berms will counterbalance the embankment. The maximum height of the fill is 30 feet. A series of 147 vertical sand drains, spaced approximately on 12-foot staggered centers, will be drilled about 60 feet below the existing ground surface near the north end of the bridge to accelerate consolidation of the foundation material before the end 210 feet of bridge is built. The drains, together with a sand blanket over the top, will allow normal settlement without the subgrade being saturated.

Sandpoint Bridge work is under the general supervision of the Idaho Department of Highways, which has Earl V. Miller as state highway engineer. Field work is supervised by R. M. Parsons, district engineer at Coeur d'Alene. A. J. Sachse, project engineer, is assisted by V. O. Olson, Clyde Wood, Albert Evans, C. D. Mills, Norman Riffle, and Bob Van Alstine. J. L. Pierson is job superintendent, and G. K. Rodgers is project engineer.

THE END



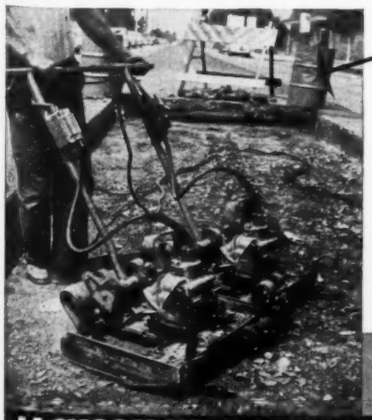
A deck section is carried to the span by a 100-ton floating derrick. A Buda-powered Skagit hoist makes the lift with a large multiple hook. *Ray Day Photo*

Best way to achieve SPECIFIED DENSITY in ROCK, SLAG, SOIL-BOUND MACADAM, GRAVEL and SAND BASE COURSES *use...*

JACKSON VIBRATORY COMPACTORS!

On jobs such as this, soil-bound macadam — 5 inches thick, the JACKSON MULTIPLE COMPACTOR, *now more powerful than ever*, achieves specified density in JUST ONE PASS. It is equally efficient on rock, or slag base and all other granular soils.

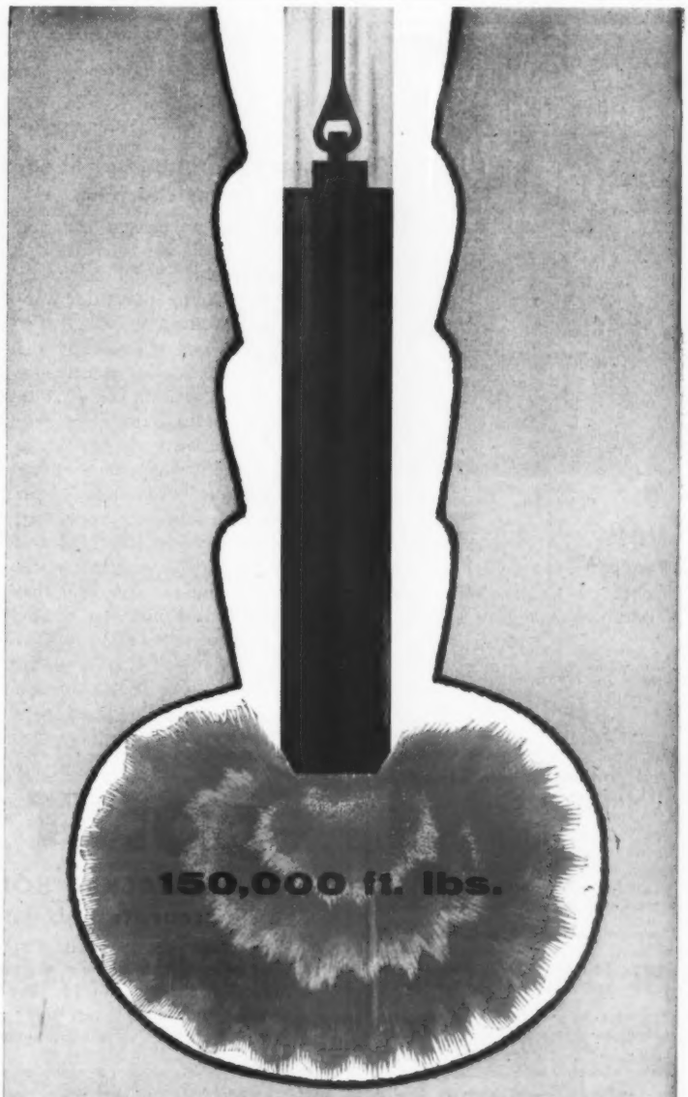
Quickly adaptable to widening, the JACKSON MULTIPLE COMPACTOR is shown here consolidating slag macadam base course 36 inches wide and 9 inches thick. Using three of the machine's powerful compactor units in tandem, it readily obtains specified density in ONE PASS.



Twin hook-up of manually guided JACKSON COMPACTORS consolidating gravel base for a large pavement repair area. These machines, used singly or in tandem, or side-by-side twin hook-ups, are exceedingly efficient for all types of granular soil base and fill compaction; also for bituminous patching and driveway construction. Operated from a trailer-mounted JACKSON POWER PLANT which may also be used for other power tools and lights.

See your Jackson Distributor or write to us for complete information on these machines.

JACKSON VIBRATORS, INC. LUDINGTON, MICH., U.S.A.



NOT formed of soft, wet concrete

BUT "FORGED" from ZERO SLUMP CONCRETE!

if **YOU** can...

Insist on the **BEST** in Foundations

Planning construction? Let us help plan your next meeting with a speaker and color slides.

FRANKI FOUNDATION COMPANY

103 PARK AVENUE, NEW YORK 17, N.Y.

3-67B

Steel batching bins

■ Steel bins for batching and for storing aggregate and cement are described in literature from Anderson Engineering Co., Cambridge 41, Mass. The concern offers knock-down, portable, and field-welded models.

Sketches illustrate two standard Anderson units, a one-stop 125-ton combination aggregate and cement-batching plant, and an undertrack railroad transfer plant.

Other Anderson products include hopper-type and tailgate material spreaders; truck, tractor, and locomotive-mounted snowplows; hydraulic cranes; and catch-basin cleaners.

To obtain Bulletin No. 211 write to the company, or use the Request Card at page 18. Circle No. 462.

The new Heltzel combination cement box and batchboard keeps cement dry in transit. When the truck dumps to charge a paver, the cement is discharged together with the aggregate to speed the operation.

Current highway problems are discussed in booklet

"Where Do We Go From Here?", a 16-page booklet published by Caterpillar Tractor Co., Peoria, Ill., discusses problems of the present highway system, modern highways and the problems involved in their financing, and the free vs. toll-road question.

More than the half the book is concerned with the story of modern highways—from their inception through their financing and construction. Copies of the profusely illustrated booklet—in French, Spanish and Portuguese as well as in English, can be obtained by writing the company. Copies are also available from Caterpillar distributors.

Cement box and batchboard mounted on dump trucks speed paver charging

■ A combination cement box and batchboard has been designed for aggregate-hauling dump trucks by Heltzel Steel Form & Iron Co., Warren, Ohio. Holding 13½ cubic feet of cement, the box is sealed by the batchboard so that no moisture or aggregate can come in contact with the cement during transit.

With this capacity, the box carries enough cement to batch the Koehring 34-E Twinbatch paver, plus a 10 per cent overload. When the batchboard is tripped by a lever, the cement is dumped on top of the aggregate and flows with it into the paver skip. Discharged in this manner, the cement does not adhere to the skip and, consequently, the full batch is utilized.

The batchbox can be tripped while the truck body is in the dump position, thus saving the operator considerable time in raising and lowering the truckbed.

Fastened to the truckbed by just four bolts, the batchbox can be easily removed. A Neoprene gasket around the cement box flexes to accommodate movement of the truckbed, preventing cement leakage. The equipment is available in a variety of sizes and styles to suit individual customer requirements.

For further information write to the company, or use the Request Card at page 18. Circle No. 417.

Are You Still Using OLD STYLE WIRE-TYING Methods?

View shows position of reel for left- and right-handed workers.

NOW . . .

You can Save $ $ Plus Man Hours of Costly Wire-Tying Time.

use

Ideal Reel

then see if you can ever again afford to do without it!

here's what it does . . .

Saves Wire: Gives 33% additional usage per pound of wire, on average. Stops waste.

Saves Work-Time: Speeds tying 6 to 8 more ties per minute—480 more ties per hour. Always within easy reach . . . ready for instant use.

Promotes Safety: No bulky shoulder coil of wire to catch on obstacles, to cause fatigue, cuts and scratches. No loose wire ends to injure an eye.

MAIL COUPON TODAY!

Specify *Ideal Reel* **Tie Wire Dispenser**

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Send Facts on IDEAL REEL.

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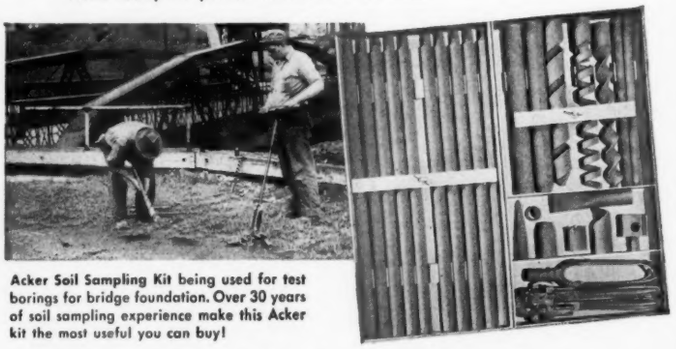
City ..... Zone .... State .....

DON'T GUESS!

use an ACKER SOIL SAMPLING KIT for accurate sub-surface information

With accurate sub-soil information, *you avoid* costly trouble later on. And, what better way to get this information than with a portable, easy to use Acker Soil Sampling Kit. For here is a versatile collection of twelve soil sampling tools packed in a handy steel kit that can be carried in any car.

Write today for prices and Bulletin 26. C&E.

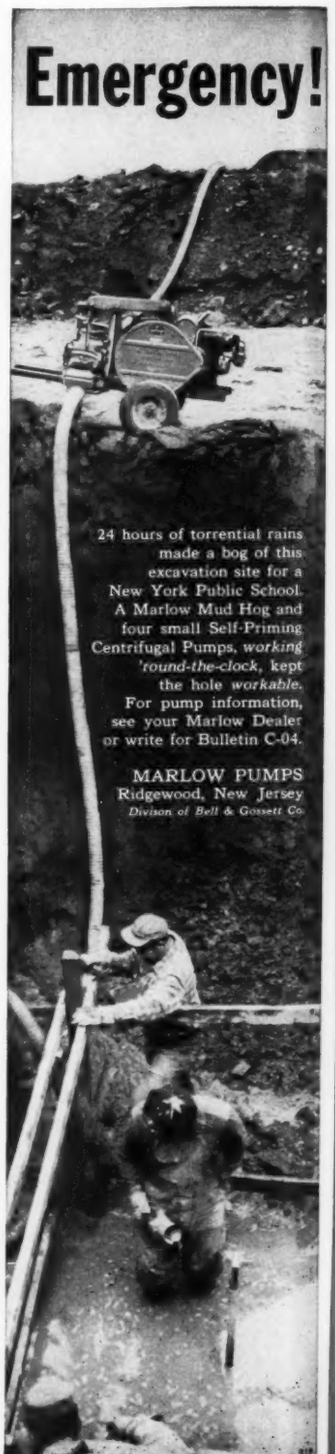


Acker Soil Sampling Kit being used for test borings for bridge foundation. Over 30 years of soil sampling experience make this Acker kit the most useful you can buy!

ACKER DRILL CO., Inc. 725 W. Lackawanna Avenue Scranton, Penna.

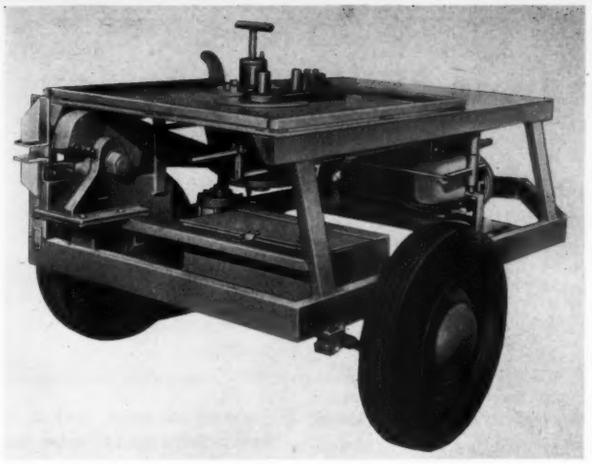
a complete line of Diamond and Shot Core Drills, Drilling Accessories and Equipment

Emergency!



24 hours of torrential rains made a bog of this excavation site for a New York Public School. A Marlow Mud Hog and four small Self-Priming Centrifugal Pumps, *working 'round-the-clock*, kept the hole *workable*. For pump information, see your Marlow Dealer or write for Bulletin C-04.

MARLOW PUMPS
Ridgewood, New Jersey
Division of Bell & Gossett Co.



Highly portable, the new Ironmaster hydraulic rod bender and shear can be towed quickly to the job.

Rod bender and shear moves around job easily

■ Designed for fabricating reinforcing rods to specifications right on the job, the new Ironmaster portable hydraulic rod bender and shear can easily be towed from job to job behind a car or truck. On the job, it can be moved by one man.

Equipped with an 8-hp gasoline engine, hydraulic pump and valves, and two double-acting hydraulic cylinders, this unit can bend and shear all sizes of reinforcing rod.

The Ironmaster has such features as automatic bending and a stirrup-bending attachment. It has a minimum of the loose pins and rollers usually required by bending machines. The shear operates fast and smoothly.

In addition to cold-working concrete-reinforcing rods, smooth surface bars, square bars, and flats, the machine can be equipped with pipe-bending dies for pipes up to 1½ inches in size.

For further information write to Midland Products Co., Midland Park, N. J., or use the Request Card at page 18. Circle No. 422.

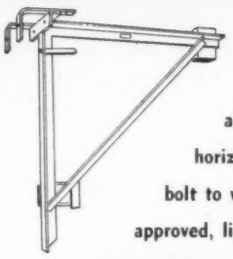
Army engineers release film on water resources

The story of a model of the Mississippi Basin and the part it will play in the program for the development and control of water resources is told in a film released by the Waterways Experiment Station of the U. S. Army Corps of Engineers, Vicksburg, Miss. The 13-minute 16-mm sound and color film entitled "Rivers in Miniature" is available on a free-loan basis to technical societies and educational institutions.

Information concerning the use of the film may be obtained from the Director of the Waterways Experiment Station, U. S. Army Corps of Engineers, P. O. Box 631, Vicksburg, Miss.

SUPERIOR WALER JACKS

A Must ON CONCRETE JOBS



Fast . . . safe . . . no sway!

Low cost, ruggedly built Waler Jack provides solid scaffolding on bridges, dams, abutments—all concrete construction jobs using horizontal walers. Use on 2 x 4 or 2 x 6 waler—or bolt to wall. Can be used on bottom waler. State approved, light weight—a real moneymaker!

FREE TRIAL ON YOUR JOB!

Write for Descriptive Literature To Nearest Address

Dealer Inquiries Invited

SUPERIOR SCAFFOLD COMPANY
Dept. CE
5624 Bankfield Ave., Culver City, California

NATIONAL PLASTER BLOCK CO.
Dept. CE
2236 N. 27th St., Philadelphia 32, Pa.

Crail Bros. Co., Long Beach, California, using a Moto-Crane with **two Waukesha Engines**—(powering the boom) a **140-GK Gasoline,** six-cyl., 4½-in. x 5½-in., 525 cu. in., 160 max. hp. at 2250 rpm; and (powering the chassis) a **145-GKB Gasoline,** six-cyl., 5¼-in. x 6-in., 779 cu. in., 240 max. hp. at 2400 rpm. Being spotted is a 22-ton Gardner-Denver mud pump with **two WAKU Waukesha** LP or natural gas units, six-cyl., 6¼-in. x 6½-in., 1197 cu. in.; each 213 continuous hp. at 1300 rpm.

EVERYWHERE in the industrial picture

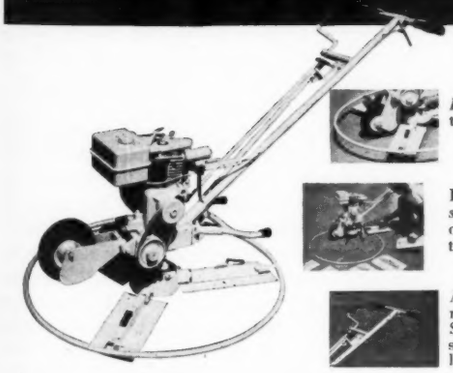
WAUKESHA ENGINES

Multi-Unit Waukesha Horsepower—this MC-524 Lorain has it! So does this Gardner-Denver mud pump that's being spotted in the Long Beach outer harbor area. Two Waukeshas give the Moto-Crane safe, sure, steady power, with a ready reserve for heavy handling. Fast, flexible power, too, for speedy movability and reliable road travel. And the mud pump with its Waukeshas is powered to remove about 700 gal. of heavy oil mud per minute in oil well deep drilling jobs. Send for Bulletins.

286

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES

Only one man to move a White TROWELER



Retractable wheel, up to trowel, down to move.

Remove blades and ring in *seconds* . . . for cleaning, changing blades, or moving through doorways.

Adjust blade pitch *during* rotation from handle. Safety throttle control stops rotation if operator lets go handle.

PORTABILITY, patented, exclusive! PERFORMANCE, unbeatable! PRICE, comparable to trowelers *without* these features! Model T-1, 36" diameter, Patent No. 2,621,568.

White MANUFACTURING COMPANY
ELKHART 9, INDIANA

Radio keys operations on these big projects

Two-way mobile communication systems lend efficiency to work on huge plant and difficult stretch of thruway

The increasingly wider use of mobile radio systems on large construction projects—especially those where operations are spread over a wide area—testifies to the efficiency, economy, and worker protection these communication systems bring to a contractor's job. Two major jobs currently under construction are operating as efficient well-knit projects through use of radio.

Mobile radio is playing an important role in the construction of a 3-mile segment of the New York Thruway in Yonkers, N. Y. (See "Three miles for $15 million," C&E, May, 1955, page 16.)

The joint-venture firms, the Corbetta Construction Co., New York City, and the Yonkers Contracting Co., Yonkers, N. Y., on the $15,400,000 project realized that this type of project, requiring close coordination between equipment and personnel, could not be accomplished efficiently without radio.

Most units in pickups

Twenty Motorola T-41 G 1A 30-watt mobile units are in use throughout the project. Seventeen units are installed in Chevrolet ½-ton pickups which are used by the various foremen. Three units have been installed in passenger cars—two for the earthmoving and structural superintendents and one for the project manager.

In addition to the twenty mobile units, a Motorola 60-watt base station is in operation, tying in all the sets on the job. An RCA 60-watt unit, set up in the project manager's office, is constantly in use. Sitting at his desk, James B. Lyttle, the project manager, can listen to all the conversation of his superintendents and foremen. In this way, he keeps abreast of the progress of construction and of any problems that arise. Leaving his office and touring the project in his car, he can still give instructions by radio. All the sets have an operating frequency, assigned to the project by the Federal Communications Commission, of 49.62 megacycles.

Speeds plant project

If a piece of equipment has mechanical trouble, the foreman in charge calls the mechanical shop, which has three mobile units assigned to it, and a mechanic is rushed out to make the necessary repairs.

If a piece of equipment has finished a job and is announced over the air, another foreman requiring the use of this machine can obtain it without delay.

If a man is hurt anywhere along the project, medical attention is rushed to him without delay.

If any unit of work requires alteration or materials, no time is lost in learning of and supplying the foreman's needs.

The contractor has approximately 250 pieces of equipment—ranging from 12 scrapers to 28 jackhammers—and 530 men on this 3-mile job. In addition, the necessity for maintaining traffic on the existing streets increased the need for careful coordination of operations. Without radios on this job, daily meetings between the foremen, superintendents, and the project manager would be necessary, with a resulting time loss.

With the use of the mobile and base radio units, only weekly meetings are held and everyone knows exactly what progress is being made in all phases of this tightly-knit project.

A huge taconite processing plant being built in the Lake Superior re-

"Our TD-9 Skid-Shovel Saves 20 Gallons of Fuel Daily"

CHARGING THE HOPPER at the rate of 125 yards hourly is just one job the TD-9 INTERNATIONAL DROTT Skid-Shovel handles so fast and efficiently. It also strips overburden and loads crushed gravel into haul trucks.

Gravel plant owner makes big equipment savings, too, replacing bigger crawler-dozer with INTERNATIONAL DROTT loader

Ray Garrett, gravel plant owner at Montrose, South Dakota, cut his equipment investment and fuel bill by putting a 41-horsepower TD-9 INTERNATIONAL DROTT Skid-Shovel to work on his materials handling.

Here's Ray's own report on his double-barreled savings:

"We feed up to 125 yards of gravel into the crusher hourly. A larger crawler and dozer used to do the job that's now being handled by the TD-9 INTERNATIONAL DROTT *Skid-Shovel.*

"There's been no drop in production but we're saving 20 gallons of fuel daily in addition to the reduced equipment cost. The Skid-Shovel's a lot more versatile, too, handling many jobs the crawler-dozer was unable to touch."

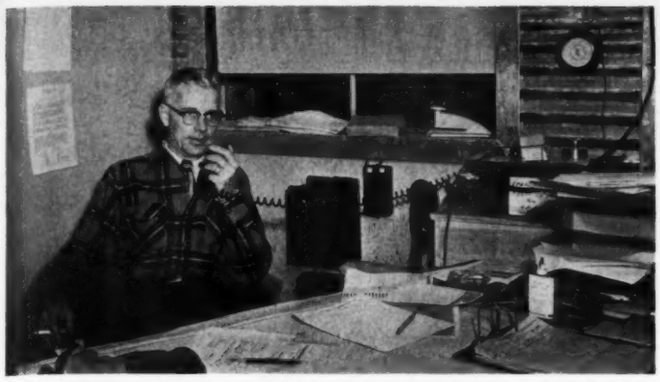
Chances are you may be wasting power and equipment on your materials handling jobs—if you're not powering them with INTERNATIONAL DROTT Skid-Shovels. Best way to find out is to call your INTERNATIONAL Industrial Power Distributor for a demonstration. You stand to gain plenty—in lower equipment costs, lower fuel bills, greater equipment versatility—so call him soon.

"SHE'S POWERFUL AND FAST," says operator Allen Alsgood. *"I have a clear view of the work at all times and the Skid-Shovel is a snap to operate,"* he adds.

INTERNATIONAL HARVESTER

INTERNATIONAL® DROTT

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS
DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN



George F. W. Meissner, chief engineer on a taconite processing-plant project, keeps in touch from headquarters through a Motorola mobile radio system. *C&E Staff Photo*

gion is one of the largest privately financed construction projects in the country today. And it is a project that requires top-level supervision at many locations all the time.

That seemingly impossible task is made relatively easy by the use of a Motorola mobile radio system. The contractor, Foley Constructors of Minnesota, Aurora, Minn., has installed a base station at the field office and remote-control units in the offices of the principal supervisory personnel. Other units are installed in the maintenance shops and in the vehicles of superintendents and foremen.

Aid in emergencies

In addition to facilitating supervisory operations, the radio system plays an important part in any emergency. With thousands of workmen on the project, occasional accidents and injuries are inevitable in spite of a very thorough and effective safety program. With the mobile radio system, an accident or injury is reported almost the instant it happens. If an ambulance is required, it is dispatched immediately. If medical attention is needed, the doctor can be called promptly. First aid instructions are transmitted directly to the spot of the accident to assure quick and proper handling of the situation.

Emergency repairs to equipment are handled with the same speed. While an operator removes a broken part from a machine, the foreman calls the shop from the mobile radio in his pickup. In a few minutes, a mechanic is on his way to the disabled machine with the replacement part. With the aid of radio, the machine may be back in operation in about the time it would have taken to drive to the shop to report the trouble.

Meanwhile, instead of rushing from place to place to observe all the construction activities and give the necessary instructions, the project manager, chief engineer, and other top-level supervisors can remain at their desks or in their automobiles, constantly keeping in touch with every phase of the operation through the radio system. THE END

Hyster fills export post

The new export field representative for the Hyster Co., Portland, Oreg., is Donald H. Nopson. He will cover Venezuela and Colombia for Hyster, maker of trucks, mobile cranes, and tractor attachments.

Road widening machine and trench filler

■ A road-widening machine designed to transfer materials from a dump truck to the side of the road in controlled quantities is illustrated in literature from the Burch Corp., Crestline, Ohio. The machine is equipped with a belt conveyor to handle dirt, sand, cinders, stone, and other fill material. Adjustable shields and a strike-off blade govern the width of the fill.

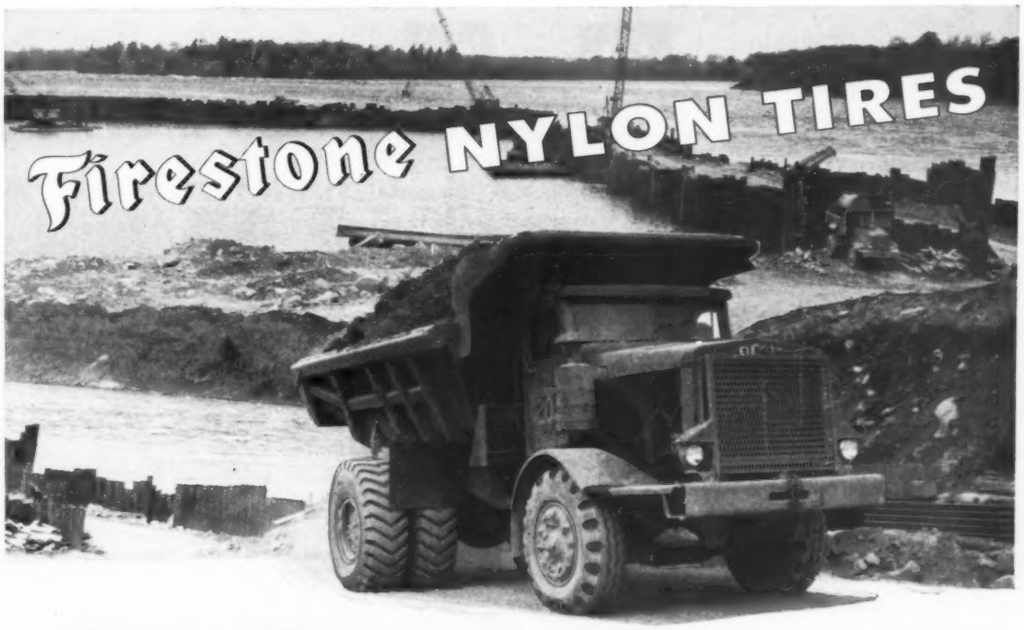
A belt conveyor inside the hopper is driven by a gasoline engine. Belt speeds are governed by the use of a four-speed and reverse truck-type transmission, together with the engine throttle.

Pulled by a dump truck, the unit has a power hydraulic drive which maneuvers the machine on and off the job. This drive will also propel the unit for short distances under its own power.

To obtain Catalog RW-202 write to the company, or use the Request Card at page 18. Circle No. 435.

New name and plant for Light Products, Inc.

Manufacture of Neo-Flasher battery-operated warning lights will be carried on by the Neo-Flasher Mfg. Co., the new corporate name of Light Products, Inc., formerly of Beverly Hills, Calif. Simultaneous with the change of name was the opening of a new plant at 3210 Valhalla Drive, Burbank, Calif.



Cut Downtime. . . .
on the St. Lawrence Seaway

INITIAL excavation for the Long Sault Dam on the St. Lawrence Seaway is right on schedule. On this project, as on all the excavation projects of the St. Lawrence Seaway, Firestone Nylon Tires are eliminating big downtime losses, giving more retreads and keeping tire costs at a minimum.

You can cut your costs with Firestone Nylon Tires because they are specifically engineered for the job. The treads give more traction and they are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

The new Firestone Safety-Tensioned Gum-Dipped* nylon cord body insures longer tire life and more retreads. The Firestone SafetyTensioned Gum-Dipped* nylon body gives the greatest protection against impact breaks . . . flex breaks . . .heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone Nylon Off-The-Highway Tires will cut your downtime and increase your profits.

*Trade Mark Reg. U.S. Pat. Off.

A TIRE FOR EVERY ROAD, LOAD AND CONDITION OF SERVICE

GROUND GRIP • ROCK GRIP • GG WIDE BASE • ALL NON-SKID • ALL TRACTION • RIB EXCAVATOR

When you buy new equipment or replacement tires, specify Firestone

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

Copyright 1955, The Firestone Tire & Rubber Co.

Cresci dump bodies, with a maximum dump angle of 60 degrees have built-in safety features to prevent tipping or excessive pull on the hoist cylinder heads.

"What's this! Here's a square foot of space going completely to waste."

Hoists and dump bodies offer high dump angle

■ The heavy-duty hoists and dump bodies made by A. Cresci & Sons, Inc., Boulevard and Grape Sts., Vineland, N. J., feature a maximum dumping angle of 60 degrees. The all-welded dump bodies are made with an 8-gage one-piece high-tensile steel floor, and equipped with double-arm roller-type hoists. Capacity ratings range from 6 to 25 tons.

The Cresci units are made with a closed-track construction that prevents tipping or excessive pull on the cylinder head assembly should the tail gate fail to open. Other safety features include outside controls, and a hoist frame built entirely of rectangular boxed tubing.

The Cresci line includes also 3, 6, and 9-ton high-lift, scissors-hoist truck bodies. These units are self-contained and can be installed in four hours with no modification to the truck chassis.

Maximum elevated position varies from 13 feet 9 inches on the 9-ton unit mounted on a tandem-axle vehicle to about 10 feet on the 3-ton unit mounted on a 1½-ton chassis. Platform dimensions of the two larger units are 13 feet 6 inches × 8 feet, while the smaller body is 10 to 12 feet long × 8 feet wide.

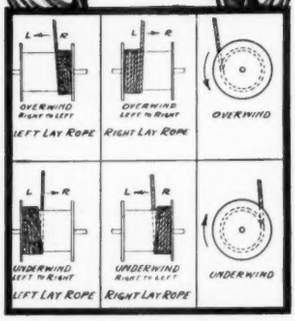
For further information write to the company, or use the Request Card at page 18. Circle No. 523.

Cedarapids representative appointed by Iowa Mfg. Co.

A new district sales representative for the Cedarapids line of aggregate-producing and bituminous-mixing equipment, R. C. Gregor, will cover four western states and two Canadian provinces for Iowa Mfg. Co., Cedar Rapids, Iowa.

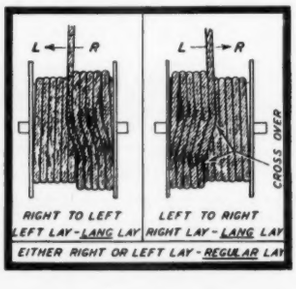
Formerly with Peter Kiewit Sons' Co., Mr. Gregor worked for a Montana distributor of Cedarapids equipment before joining the Iowa staff. He will make his headquarters in Salt Lake City, Utah, and will cover Utah, Wyoming, Montana, Colorado, and the provinces of Alberta and Saskatchewan in Canada.

Tuffy® tips on the "lays" and



Rope Lay for One Layer Winding

These diagrams show when it is best to use right lay or left lay rope on one-layer winding. The direction of winding is determined by standing behind the drum, looking toward the direction of the rope travel.



Partially Worn Regular Lay

Regular Lay ropes are used to a greater extent than Lang Lay, because Regular Lay wire ropes stand up better under the hazards of installation and use. Regular lay ropes are less susceptible to drum crushing and are not so readily damaged on sheaves of small tread diameter.

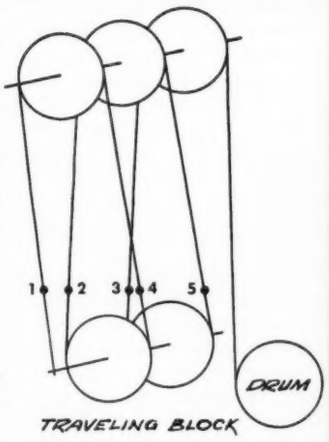
Partially Worn Lang Lay

Lang Lay ropes are about 15% more flexible than Regular Lay, and have a wearing surface *per wire* about three times as great. However, they crush out of shape more easily on small drums and are more easily damaged by sheaves with small tread diameter.

How To Count The Number of Parts Supporting the Load

The wire rope on many machines is not used in a single part or direct pull. It is often reeved through sheaves, which multiplies the power applied to the load. Drawing an imaginary line across the reeved rope parts, above or below the "crossing", and counting across gives you the number of parts supporting the load. Always include the rope end to the block, but not the part leading to the drum.

Send For Free Chart Which Allows Easy Figuring of Actual Stress On Rope For Any Given Piece of Machinery Reeving From One to Eight Parts.



Rope for Two Or More Layer Winding

When a rope winds on the first layer across the face of a drum, it usually travels in a uniform pattern. But when it reaches the flange of the drum, the rope rides on the last strand of the first layer for one turn. Then, it slips into the grooves between each course of rope on the first layer. To move across the drum in this manner, the rope actually winds *back* a turn in each revolution. Then it must jump across *two* grooves in the first layer. This always occurs on the even-numbered layers, and often causes crushing. This abuse is minimized by use of properly designed grooves, spacers and lifters.

Trailers furnished as job-site living quarters

■ Easily-towed living and office trailers used by maintenance-of-way gangs on railroads are now being adapted to house large numbers of construction workers on remote jobs. Pulled by any type of vehicle, the Morrision-International Campcars are towed to the job site to serve as living quarters for the duration of the job.

Six different types of Campcars are now available to provide complete living facilities for large construction gangs, as well as office and storage space, including a 2 to 5-man self-contained unit; a dormitory unit with upper and lower bunks, which provides accommodations for 8 men and contains lockers, washroom, shower, and toilet facilities; a single-unit complete kitchen with living facilities for a cook and helper; a dining and recreation unit that accommodates up to 22 men; a combination kitchen, dining, and recreation unit for 8 men; and an office and storage unit that sleeps 2 men, with a large partitioned area for light tools and supplies.

Typical of the equipment found on the Campcars are the furnishings of the five-man unit. This contains four man-size bunks at one end, with storage drawers and shoe lockers under the bunks. At the other end is a dinette for eating, recreation, and office use. This dinette converts into a bunk, and the seats provide storage for the foam-rubber mattress and bedding.

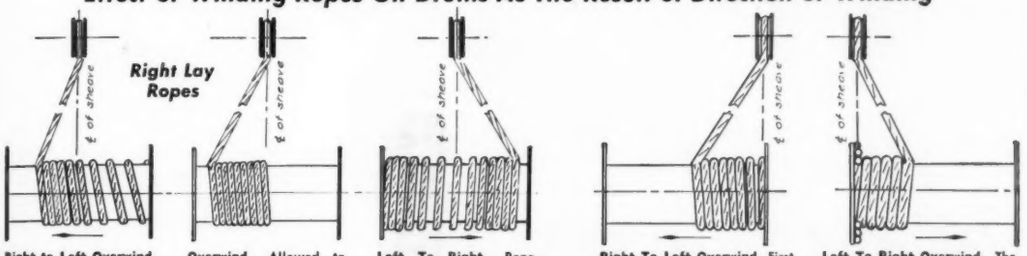
There is a door at each end, a propane stove, a combination ice and electric refrigerator, a full-size sink and a separate wash basin, a 30-gallon hot-water heater, a space heater, a full-size shower stall with a 140-gallon water-storage tank, clothing lockers, cabinets, and a dry-chemical lavatory.

The Morrison-International Campcars can operate near or away from city utilities and are constructed to withstand rough off-the-highway travel.

For further information write to International Equipment Div., Morrison Railway Supply Corp., P. O. Box 185, Station F, Buffalo 12, N. Y., or use the Request Card at page 18. Circle No. 471.

reeving of *WireRope*

Effect of Winding Ropes On Drums As The Result of Direction of Winding



Right to Left Overwind. Rope winds open to centerline of the drum, then it winds close.

Overwind. Allowed to run freely, the rope winds close to the left from center of drum.

Left To Right. Rope winds close the first four turns, open to center of drum, then close.

Right To Left Overwind. First two turns about 3/16" open, the balance close. Does not build up on flange.

Left To Right Overwind. The rope will build up three to four turns on flange before crumbling, then wind close.

Yours For The Asking—The "Know How" of Specialists

Put your problems up to Union Wire Rope technicians who work closely and continuously with users and machine manufacturers to lengthen the service life of wire rope through both design and application.

Out of this exhaustive research has come the industry's greatest advancement—the Tuffy family of special purpose ropes that offer you the construction, operating characteristics and grade of steel that are best for the particular job for which each is constructed.

So thoroughly have the ropes of the Tuffy family been engineered that the chances of ordering the wrong rope is virtually eliminated. When you order Tuffy wire rope, you...

Stop Specification Complications—Say Tuffy

Tuffy Scraper Rope
Mount a reel on your scraper and get full service out of every foot. Specially constructed for scraper service where complex destructive forces overwhelm ordinary rope.

Tuffy Dragline
Flexible enough for easy casting, tough enough to give you maximum abrasive resistance and service life in handling wet or dry, hard or soft materials.

Tuffy Dozer Rope
Has the stamina needed to stay on the job after ordinary ropes are thrown away. In 1/2" or 9/16" size on 150' reels for easy mounting to facilitate cut-off without waste.

Tuffy Slings & Hoist Line
Slings of the famous Tuffy machine braided, kink-resisting, 9-part construction, cut replacement costs. For balanced performance, team them up with Tuffy Hoist Line.

Your Tuffy Distributor: Dependable Source of Information.

His job is more than just supplying the wire rope you want—when you want it. Your Tuffy distributor is always on the alert to help make your equipment do the best possible job, at the lowest possible cost. When you have a problem that calls for special knowledge concerning your equipment that uses wire rope, give your Tuffy distributor a call. He'll be glad to furnish the help you need including factory engineers.

union Wire Rope corp.
2260 Manchester Avenue, Kansas City 26, Missouri
Specialists in High Carbon Wire, Wire Rope and Braided Wire Fabric

New hose now available for pile-driver service

■ A new wire-braid hose designed especially for pile-driver service has been announced by the Thermoid Co., 400 Whitehead Road, Trenton, N. J. The new Powerflex hose will handle saturated steam at 385 degrees F at 200 psi. It is available in four sizes of 1½, 2, 2½, and 3 inches ID.

Two braids of steel wire prevent sudden bursting of the hose. A special

braiding pattern develops a positive bonding of the tube and cover to the wire-braid reinforcement. One ply of insulation is mechanically fixed between the braids.

A positive bond between the couplings and the outside wire braid provides a static ground and permits use of this hose in areas where flammable liquids are present.

Powerflex pile-driver hose is available in 50-foot lengths weighing from 100.5 pounds for the 1½-inch size to 197 pounds for the 3-inch size.

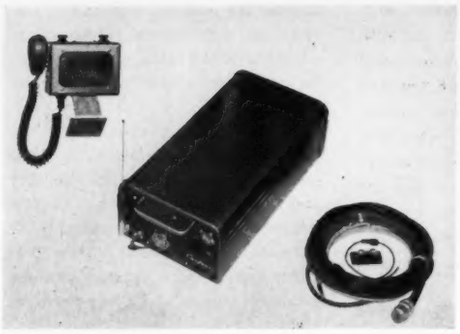
For further information write to the company, or use the Request Card at page 18. Circle No. 451.

Detroit Diesel appoints

Charles W. Frederick has been appointed director of engineering for the Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich. Formerly assistant chief engineer of the Chevrolet Division, Mr. Frederick replaces Laurence S. Sheldrick in the post.

Mr. Frederick, a graduate of the University of Michigan, has been associated with General Motors since 1923.

Royce A. Hill, the new manager of Florida diesel engine sales for the company, will direct industrial and marine sales and service activities of the Miami headquarters and the Jacksonville branch in Florida.



The new RCA Carfone-150 two-way radio system is designed for communication between a central dispatch point and tractors, fork lifts, straddle trucks, yard cranes, and other vehicles in a material-handling fleet.

Two-way radio coordinates material-handling fleet

■ A low-power industrial two-way radio system designed for material-handling vehicles has been announced by Radio Corporation of America, RCA Bldg., 30 Rockefeller Plaza, New York 20, N. Y. Known as Carfone-150, the new system incorporates both mobile units and base-station equipment, with 3-watt input, for operation over the entire 148 to 174-megacycle band.

The compact equipment is intended for two-way communication between a central dispatch point and fork lifts, straddle trucks, towing tractors, yard cranes, and other vehicles in a material-handling fleet.

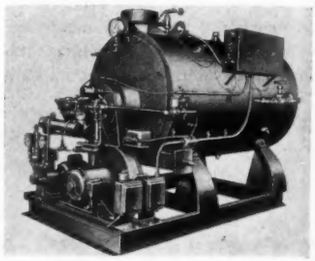
The Carfone-150 mobile unit, which can be mounted horizontally or vertically, is available for operation on either 6 or 12-volt motor-driven vehicles or higher-voltage electric trucks. It measures only 6 inches high, 15 inches wide, and 17¾ inches deep. The base-station equipment, which combines the mobile transmitter-receiver chassis with an ac power supply, measures only 10¼ inches high, 19¼ inches wide, and 18 inches deep.

The new radio equipment features sectionalized chassis construction, with transmitter, receiver, and power supply designed as independent units and assembled in a single case.

For further information write to the company, or use the Request Card at page 18. Circle No. 456.

Compact 50-hp boiler offers fuel economy

■ A compact 50-hp steam generator designed to burn No. 4 oil has been developed by Cyclotherm Division, National-U. S. Radiator Corp., Oswego 5, N. Y. Because of the price differential between No. 4 residual oil and light oils, the small boiler is said to cut fuel costs as much as 30 per cent. Efficiency is reported at 80 per cent or better.



Burning No. 4 fuel oil, this Cyclotherm 50-hp boiler—designed for installation where space is limited—is reported to reduce fuel costs by as much as 30 per cent.

The new boiler, which requires less than half the space of standard 50-hp units, can be installed in 20 square feet of floor area. It requires only 4 feet 8¼ inches of headroom. Since no cement foundation is necessary, this boiler can be installed any place where fuel, water, and electricity are available.

Cyclotherm engineers expect that this unit will prove profitable in metropolitan areas and in plants that operate under wide variations in steam load.

Other Cyclotherm steam generators range in size from 18 to 500 horsepower, with pressures ranging up to 200 psi.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 478.

Equipment valuation for insurance purposes

■ A booklet from Hartford Accident & Indemnity Co., Hartford 15, Conn., suggests a method for determining the actual cash value of construction machinery for insurance purposes.

The booklet provides blanks in which the estimate of equipment value can be made more accurately than by the usual method—assuming a uniform rate of depreciation and subtracting it from the original cost each year.

The method suggested weighs the factors that make up depreciation, such as physical condition and obsolescence. Computed depreciation is subtracted from the cost of replacing the machine with a similar one at present market value.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 476.

BUILT FOR

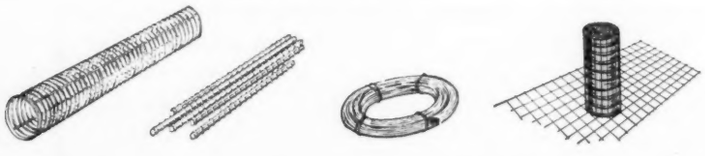
DURABILITY

WITH

LACLEDE STEEL REINFORCEMENT

Laclede reinforcing steels—including multi-rib round reinforcing bars, spirals, tie wire, welded wire fabric and accessories—give vital strength and permanency to this new St. Louis housing project.

Scheduled for occupancy early in 1956, the Darst Homes will provide attractive and comfortable living quarters for 1,238 families.



LACLEDE

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

CONVENTION CALENDAR

August 12–24 Seabee Veterans of America
National Convention, Hayes Hotel, Jackson, Mich. Norman P. Sercombe, convention chairman, SVA, Hayes Hotel, Jackson.

August 16–19 National Sand and Gravel Association and National Ready Mixed Concrete Association
Joint Committee Week, Palmer House, Chicago, Ill. Vincent P. Ahearn, executive secretary, NSGA and NRMCA, 1325 E St. N. W., Washington 4, D. C.

August 31–September 25 General Motors Powerama
Exposition of Diesel-Powered Equipment, Century Exposition Hall, Chicago, Ill. William Hamilton, coordinator, GMC, Detroit, Mich.

September 8–10 Western Association of State Highway Officials
Thirty-fourth Annual Conference, Jackson Lake Lodge, Moran, Wyo. R. G. Stapp, chairman of program committee, WASHO, Wyoming Highway Department, P. O. Box 931, Cheyenne, Wyo.

September 12–14 American Road Builders' Association
Third National Conference of County and Highway Officials, Greystone Hotel, Gatlinburg, Tenn. Ben F. Ostergren, managing director, County and Local Roads Division, ARBA, World Center Bldg., Washington 6, D. C.

September 29–30 Standards Engineers Society
Fourth Annual Meeting, Hotel Statler, Hartford, Conn. Arnold B. White, program chairman, c/o Veeder-Root, Inc., Hartford, Conn.

October 2–5 American Public Works Association
Public Works Congress and Equipment Show, Hotel Schroeder, Milwaukee, Wis. D. F. Herrick, executive director, AWPA, 1313 E. 60th St., Chicago 37, Ill.

October 2–8 International Road Federation
Second World Meeting, Food and Agricultural Organization Buildings, Rome, Italy. Robert O. Swain, executive director, IRF, 1023 Washington Building, Washington, D. C.

October 4–7 Ohio Short Course on Roadside Development
Short Course of Instruction, Departments of State Building, Columbus, Ohio. Wilbur J. Garmhausen, chief landscape architect, Ohio Department of Highways, 450 E. Town St., Columbus 15, Ohio.

October 10–12 American Society of Lubrication Engineers and American Society of Mechanical Engineers
Second Annual Joint Lubricating Conference, Hotel Antlers, Indianapolis, Ind. William P. Youngclaus, Jr., administrative secretary, ASLE, 84 E. Randolph St., Chicago, Ill.

October 17–21 National Safety Congress and Exposition
Forty-third Conference, Conrad Hilton Hotel, Chicago, Ill. R. L. Forney, secretary, NSC, 425 N. Michigan Ave., Chicago 11, Ill.

October 25–28 American Society of Civil Engineers
Annual Convention, Hotel Statler, New York, N. Y. Don P. Reynolds, assistant to secretary, ASCE, 33 W. 39th St., New York 18, N. Y.

October 27–28 National Slag Association
Thirty-eighth Annual Meeting, Grand Hotel, Point Clear, Mobile, Ala. E. W. Bauman, managing director, NSA, 613 Perpetual Building, Washington 4, D. C.

November 2–4 Virginia Highway Conference
Conference, Virginia Military Institute, Lexington, Va. R. P. Ellison, executive assistant, Department of Highways, 1221 East Broad St., Richmond 19, Va.

"A free democratic people, informed of the nation's needs and problems . . . will respond with action."
—Stuart Peabody

New highway directory lists officials, engineers

The 1955 edition of "Highway Officials and Engineers" the pocket-size directory issued annually by the American Road Builders' Association, is available from the organization's headquarters in the World Center Building, Washington 6, D. C., at $1 per copy.

As in past years, the compact booklet lists more than 1,500 names, titles, and addresses of administrative engineers and officials in the 48 state highway departments and in the District of Columbia. Personnel of the U. S. Bureau of Public Roads, and of toll-road authorities, and directors of the ARBA are similarly listed.

The last section of the booklet gives a tabulation of highway funds expended for construction and maintenance in each of the states during 1954, and estimates the 1955 expenditures for each state. A tabulation of states having legislative authority to construct toll roads is also included in the book.

Cellular subflooring

■ A new technical bulletin describing American cellular suflooring has been released by American Steel Band Co., Box 565, Pittsburgh 30, Pa.

Featured in this bulletin are safe-load tables and section properties for each type of flooring available, along with erection details and welding specifications.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 412.

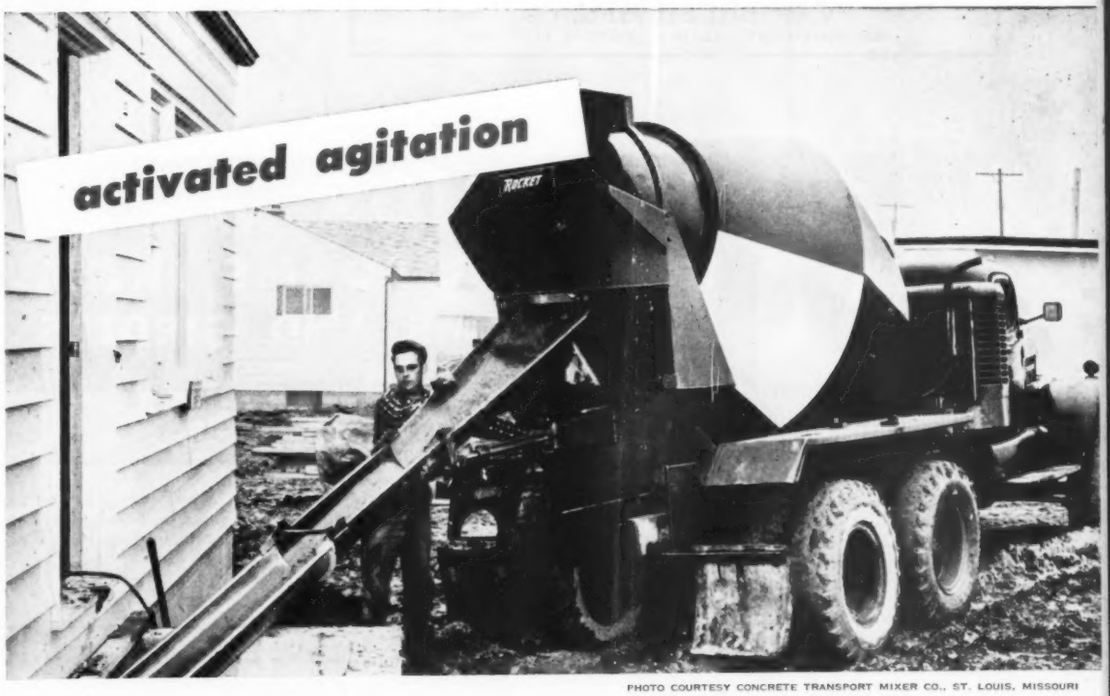


PHOTO COURTESY CONCRETE TRANSPORT MIXER CO., ST. LOUIS, MISSOURI

CHRYSLER *with gýrol Fluid Coupling . . . powers the Rocket, saves weight for added payload, protects equipment*

Off and running with the new building season is this 4½-cubic-yard Rocket Transit Mixer. It is pouring concrete for a dwelling basement in Youngstown, Ohio.

The operator stands at the controls grouped at the rear of the mixer. Hydraulically controlled chute with aluminum extension enables fast, onto-the-spot discharge. An electrical revolution counter enables operator to regulate mixing action to meet highly specialized requirements. The Rocket Mixer employs a continuous blade design claimed to give faster, more efficient mixing action.

Up front behind the truck cab, the Rocket packs a Chrysler Industrial 30 Engine—part of its standard equipment. Between engine and Chrysler-supplied three-speed transmission is the highly regarded Chrysler gýrol Fluid Coupling. Equipped in this manner, the Rocket Mixer offers its users a 230-cubic-inch displacement engine—an engine with ample power, yet lightweight to permit maximum payloads. Chrysler gýrol Fluid Coupling transmits engine power smoothly, at the same time absorbing shock loads, protecting engine and drive line, adding years to the life of the equipment.

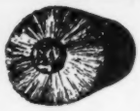
In selecting Chrysler Industrial Engines to power their equipment, manufacturers know they can specify Chrysler Engines factory-equipped to meet their needs. An extra large selection of optional equipment is available for their choosing.

When you offer customers Chrysler-powered construction equipment, you offer them power they know and respect, and you assure them of top performing equipment. Remember that Chrysler Industrial Engines are not expensive. Production-line methods adapted to specialized industrial engine building provide custom-built engines at mass-production prices.

See a Chrysler Industrial Engine Dealer or write: ***Dept. 118, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

CHRYSLER INDUSTRIAL 30 Engine
230 cubic-inch displacement

CHRYSLER *Industrial Engines*
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION
HORSEPOWER WITH A PEDIGREE
AGRICULTURE • INDUSTRY • CONSTRUCTION • OIL FIELD



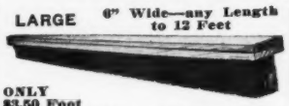
Trade in Your Old Cores

FLASH ! ! DO YOU KNOW
WE MANUFACTURE
ROTARY SWEEPER CORES
Most Any Popular Make To Fit
GRACE • HOUGH • LULL • ROSCO
LITTLEFORD • DETROIT HARVESTER
and Others - Send Your Specs

REFILLS—SPECIALISTS WITH SPRING STEEL WIRES AND FIBRES
REPAIRS - ANY MAKE SIZE OR TYPE - 24 HR. SERVICE

PECKERWOOD STEEL WIRE DRAGS

LARGE 6" Wide—any Length to 12 Feet



ONLY $3.50 Foot
Buy in Lengths Assemble Your Own
NAME YOURS

Drags Not Staple Set
SMALL
Fits Your Frame
3" Wide
15" Long
Now $2.50 ea.

Prices Subject to Change Without Notice

SINCE **VAN BRUSH MFG. CO.** 1928
327 SOUTHWEST BLVD - KANSAS CITY, MO.

The Techkote air meter designed for measuring entrained air in concrete, mortar, plaster, and soil.

5 SUPERIOR WAYS OF HANGING FORMS FROM STEEL BEAMS AND GIRDERS
(NOT FIREPROOFED)

Especially designed to meet field conditions on BRIDGE SUPERSTRUCTURES

Standard Coil Hanger Frame

When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior *Standard* Hanger Frames. Detail at left shows their use with double ledgers, ½" coil bolts, and flat washers. Total safe load on both bolts is 10,000 lbs., or 5,000 lbs. per bolt.

Plate Hanger Frame

FOR ADJUSTMENT FROM TOP OF DECK

The Plate Hanger Frame, shown at left, has metal plates with a punched hole instead of wire coils. The Coil Bolts are passed through the holes and secured from above with coil nuts. The plates provide adequate bearing for the nuts, which being square will not turn when the bol is removed. The installation and necessary adjustment to bring the deck forms tight against the flange are from above the deck. The total safe load on both coil bolts is 10,000 lbs., or 5,000 lbs. per bolt.

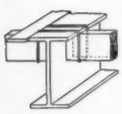
Special Hanger Frame

AT LOW HAUNCH

AT HIGH HAUNCH

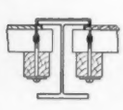
The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch on the upper flange, which varies in depth. Superior *Special* Coil Hanger Frames were developed to meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the ½" Coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail at left.) Total safe load per frame is 10,000 lbs., or 5,000 lbs. per ½" bolt .

Wire Beam Saddle



Wire Beam Saddles are used to hang centering joists from structural steel beams when the beams are not fireproofed with concrete. On non-fireproofed structures the load is determined by the allowable spacing of centering joists rather than the capacity of the hanger. Available in three gauges and sizes as required. Will carry safely, total loads of 2,500 lbs. to 6,000 lbs. Layouts and estimates will be sent upon receipt of plans or quantities. No obligation.

Coil Beam Saddle



Superior Coil Beam Saddles are used, as shown at left, where hanger wires may be cut after stripping the forms. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each ½" Coil Bolt. Coil Beam Saddles are also furnished for ¾" and 1" bolts.

WORKING PARTS (Bolts and washers) are returnable. Layouts and estimates for Superior Hangers are available without obligation.

SUPERIOR CONCRETE ACCESSORIES, INC.
4110 Wrightwood Avenue, Chicago 39, Illinois
New York Office 1775 Broadway, New York 19, N. Y.
Pacific Coast Plant 2100 Williams St., San Leandro, Calif.

Entrained-air meter has wide measuring range

■ The improved Techkote air meter is now a wide-range testing instrument suitable for measuring accurately up to 22 per cent entrained air. The instrument can now measure entrained air in such diverse materials as lightweight concrete, mortar, plaster, and soil, in addition to concrete.

The new wide-range feature is now standard on all new Techkote air meters at no increase in price. Techkote air meters now in service may have this feature installed at a nominal charge.

For further information write to Techkote Co., 820 W. Manchester Ave., Inglewood 1, Calif., or use the Request Card at page 18. Circle No. 423.

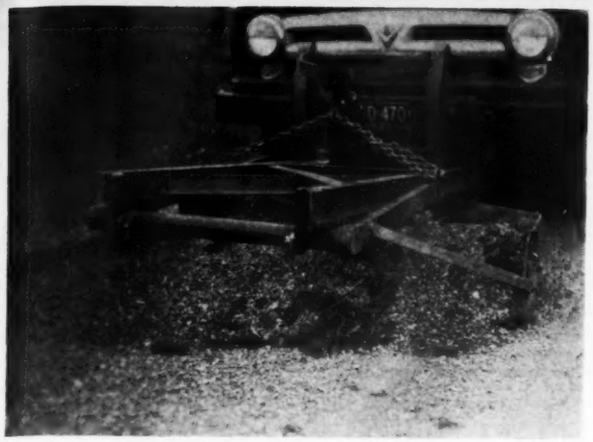
Catalog describes tractors and matching equipment

■ John Deere crawler and wheel tractors and attachments are illustrated in a new catalog available on request. The tractors shown and described include the track-type Model 40 and the Model 40 Utility and the 40 Standard, both wheel-type units.

John Deere-built equipment for the tractors includes a front-mounted hydraulic bulldozer for the crawler unit, and a heavy-duty center-mounted mower for the wheel tractors. Other matching attachments shown include a rear-mounted angling blade, rear-mounted scoop, front-mounted snowplow, rear-mounted fork lift, road maintainer, and rubber-tire material-handling trailers and wagons.

In the allied equipment section are found loaders, winches, log carts, backhoes, wheel-type scrapers, portable saws, a post driver and cement breaker, a power hole digger, a gang mower, a hydraulic crane, scarifying and leveling blades, a rake, and a cement mixer. Power sprayers of different kinds, a rotary sweeper, trenchers, snow blowers, and fire-suppression plows are among other tools made by well known allied manufacturers.

To obtain this literature write to John Deere & Co., Moline, Ill., or use the Request Card at page 18. Circle No. 420.



The new Gledhill Push Shaper mounts on a truck to provide a maneuverable shoulder maintainer.

"Oh, don't worry—
I don't inhale."

Truck-mounted maintainer

■ A new push-type shoulder maintainer has been announced by Gledhill Road Machinery Co., Galion, Ohio. Known as the Gledhill Push Shaper, the equipment was designed to provide a shoulder maintainer that can be mounted on the underframe of a truck or on the front push frame to which snowplows are attached.

The maintainer is powered from the existing hydraulic equipment of the truck for raising and lowering. Covering a 6-foot span, the attachment weighs 600 pounds.

Because it is truck-mounted, the blade is more easily maneuvered in traffic than grader-type maintainers. A further advantage of the unit is its low operating cost.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 416.

Threaded nails have superior holding power

■ A threaded nail offering greater holding power than the common or straight-shank nail is discribed in literature from the Steel Company of Canada, Ltd., Hamilton, Ontario, Canada. According to this folder, the Ardox threaded nails are now available at prices which are actually lower per nail than those of common nails.

The Ardox nails are offered in sizes from 1 to 12 inches, and in types to replace common, box, finishing nails, and spikes.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 546.

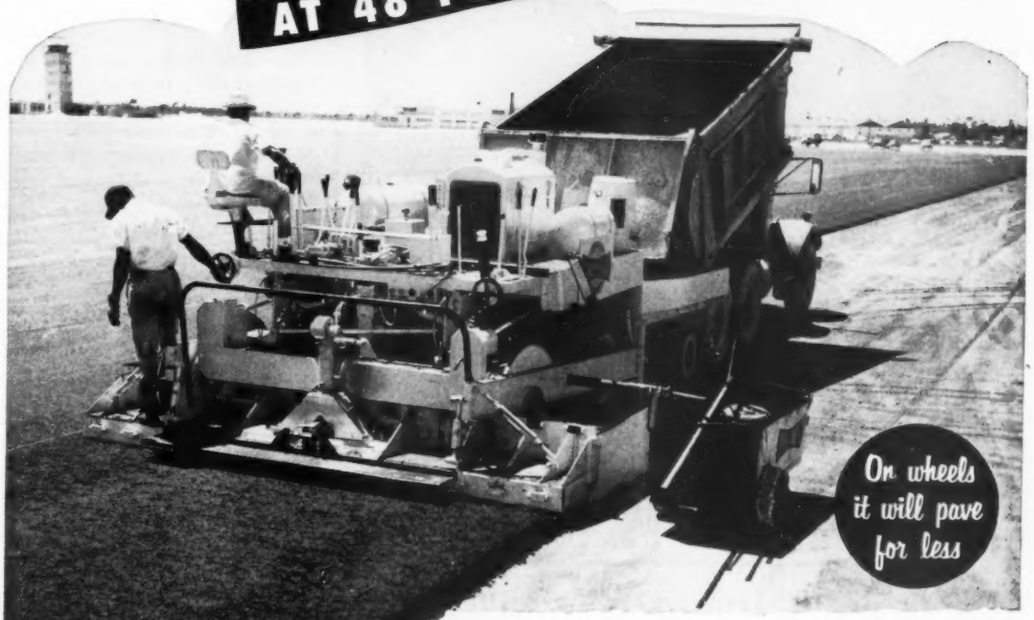
General sales manager for Gar Wood Industries

Harold H. Hippler has been made general sales manager of Gar Wood Industries, Inc., Wayne, Mich., manufacturer of truck equipment and construction machinery.

Starting with the firm in 1924, Mr. Hippler has served Gar Wood as manager of the truck-equipment sales branch in Boston and assistant branch manager in Boston and Detroit. Last year, he was made assistant director of sales and service administration.

200 TONS AN HOUR

AT 48 FT. A MINUTE!



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ADNUN JUNIOR BLACKTOP PAVERS

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MULTIFOOTE CONCRETE PAVERS

BLAW-KNOX

ONE Blaw-Knox PF-90 Bituminous Paver Finisher—not two machines! Steady, hour after hour production taking the entire output of the plant—not a short run for *exhibition purposes!*

That's the performance of the Blaw-Knox Bituminous Paver Finisher at Homestead Airbase at Homestead, Fla. At times the Blaw-Knox was able to secure material ahead to put down *270 tons an hour!*

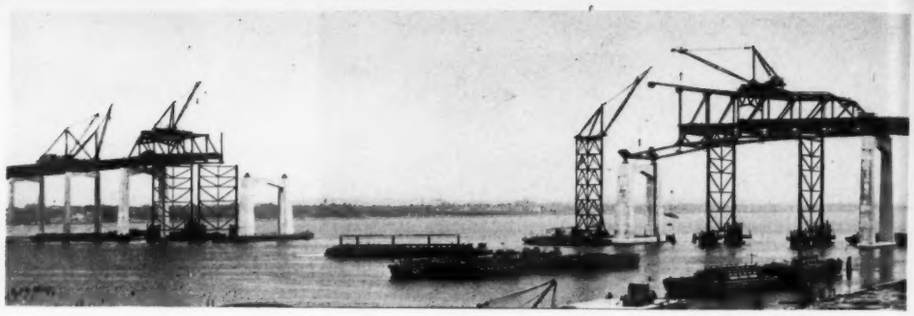
Compare this with recent records claimed for other asphalt finishing equipment. Note the smoothness of the rolled course, the firmness of the edge and the few men necessary for the job.

No other machine has ever laid asphalt at such speed AND ACHIEVED SUCH PERFECT RESULTS. Now is the time to replace slow, obsolete equipment and cut your paving costs. Ask for the new PF-90 Catalog.

BLAW-KNOX COMPANY
Construction Equipment Division
1916 State Street, Nunda, New York

ASPHALT and CONCRETE PAVERS

The first of the two 108-ton girders completing the east-approach steelwork is lifted 127 feet to the piers by a traveler with two 115-ton derricks.



With the girders for the east approach for the 9,560-foot-long bridge in place, far left, work proceeds on the 1,270-foot tied-arch central span. Between the creeper travelers is the derrick boat.

Dual-boom rig sets girders on Newark Bay Bridge

Central continuous tied-arch span, 1,270 feet long, remains to be completed on 9,560-foot structure

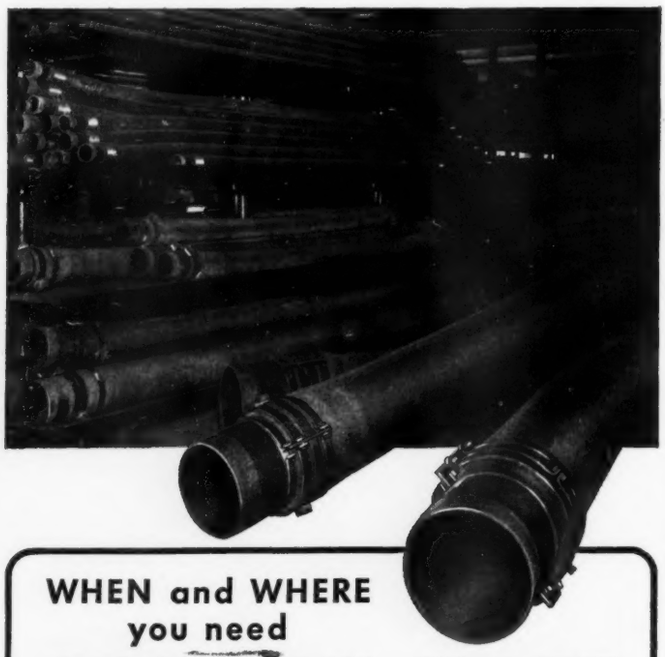
Work on the $40 million Newark Bay Bridge, a span carrying an extension of the New Jersey Turnpike 8 miles from the Newark Airport Interchange to the Holland Tunnel, moved nearer completion with the erection of the last two 108-ton east-approach girders.

The bridge, 9,560 feet long with approaches, will provide a new direct route from Manhattan to the Newark Airport and to metropolitan New Jersey areas. It also gives Bayonne and Jersey City a high-speed route to towns in Essex and Union counties and to Newark Airport.

The girders for the 4,057-foot-long east approach—each 170 feet long and 11½ feet deep—were shipped to the Bayonne peninsula by rail after being fabricated in the Pottstown, Pa., works of Bethlehem Steel Co. Car floats, pulled by a tug, carried the flatcars and girders to a huge traveler crane with two 115-ton derricks which set the members. Once the rig had set the girders on the 127-foot concrete piers, its job on the bridge was finished. The traveler, which completed erection of the west approach in February, is now being dismantled.

Center span remains

Only the central portion of the bridge—a continuous tied-arch span with an over-all length of 1,270 feet—remains to be finished. Two creeper travelers, each equipped with a 40-ton stiffleg derrick with 100-foot boom, are currently working 135 feet above the channel to erect the continuous steel trusses which make up the arch span. Falsework, set up on piles so that work could be started on the central span, is now being removed by a tower derrick boat with 138-foot-high tower supporting a 35-ton stiffleg derrick. THE END



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So the next time you need Suction Hose, or any other hose*, call or wire your nearest Continental Warehouse. You'll like the service you get.

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MEMPHIS 3, Tenn. 268 Madison Ave.
NEW YORK 7, N. Y. 81 Murray St.
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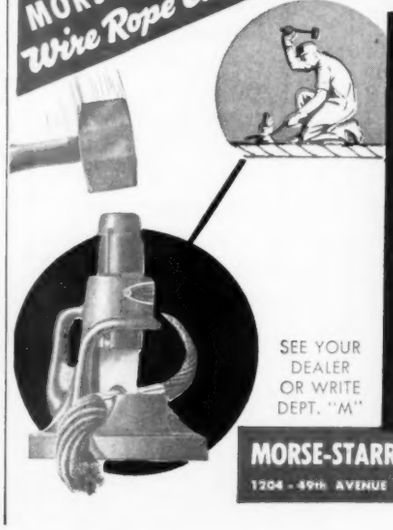

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No special skill is required in the hammer-blow operation of this perfect wire rope cutting tool.

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FAST
Ten Seconds, or less, is the usual time required to complete the smooth, clean cut.

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The operator is safe, because the blade is enclosed and locked in the body of the tool.

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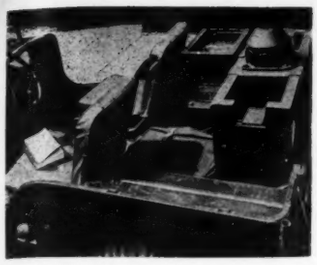


The Odograph instrument mounted on a jeep.

Instrument maps route traveled by vehicle

■ An instrument that automatically draws a map of the route taken by the vehicle on which it is mounted offers a fast method of mapping and surveying.

Usually mounted on a jeep, the Odograph M-1 determines direction by a magnetic compass, and distance from the speedometer of the vehicle's transmission. Combining these two factors mechanically, the instrument produces corresponding movements of a plotting pencil that makes a scale drawing of the route traveled on a map table.

The Odograph M-1 can be used for map making or plotting the position of observed objects relative to a given base. It can also be used for survey work, in which the position of points relative to a given known base are located.

Surveys need not run in a straight line, since the mapping pencil will locate the position of the vehicle anywhere along the way to the destination. Furthermore, the instrument's coordinate counter dials record the grid coordinates of the vehicle with respect to the starting point. The instrument can be used with any vehicle with a speedometer drive of 1,000 rpm.

The Odograph M-1 was originally made for the U. S. Army Corps of Engineers by Monroe Calculating Machine Co. and International Business Machine Corp. A number of these units are now available as army surplus at a fraction of their original cost.

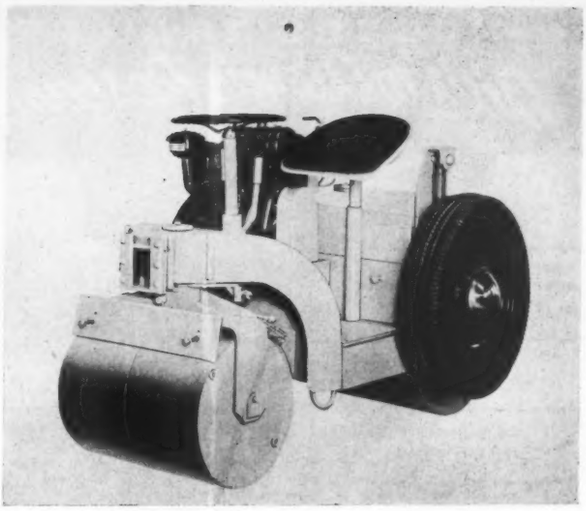
For further information write to Esse Radio Co., 42 N. South St., Indianapolis 25, Ind., or use the Request Card at page 18. Circle No. 481.

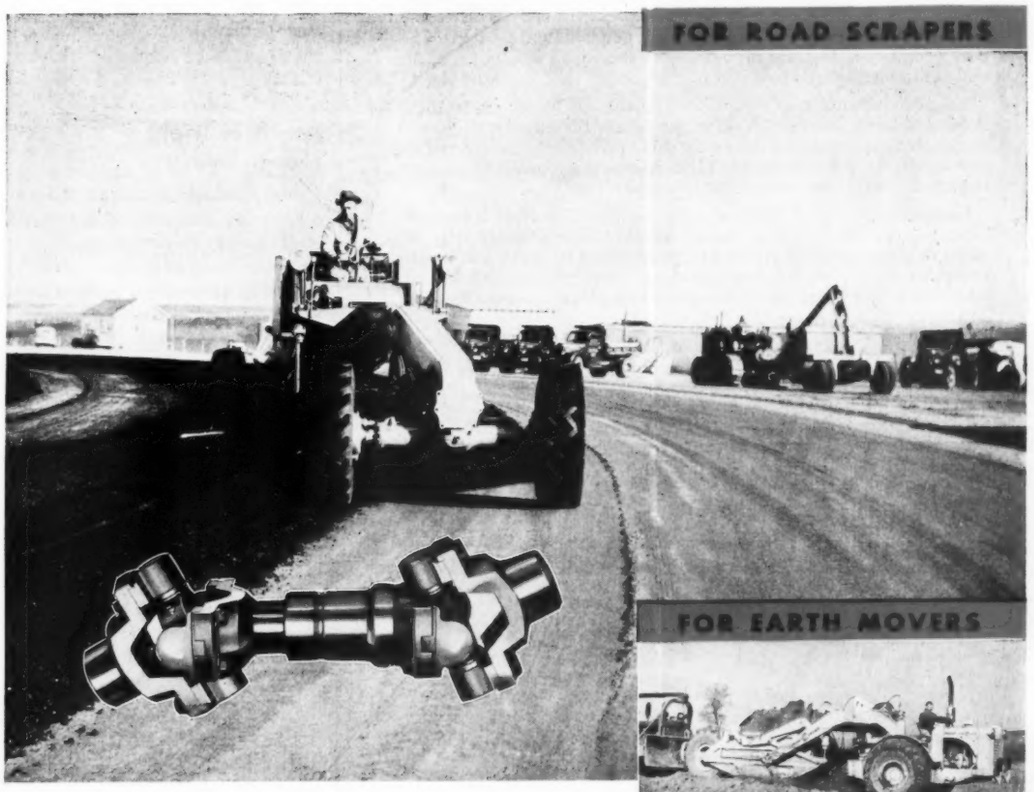
K. A. Roesch heads White's Autocar division

The new general manager of the Autocar Division of White Motor Co., Exton, Pa., is Karl A. Roesch. Formerly director of service for the division, Mr. Roesch succeeds Edward F. Coogan who has retired.

A veteran of 27 years with the company, Mr. Roesch rose through various sales posts in Cleveland, Columbus, and Cincinnati, Ohio to become manager of the Cleveland branch in 1942. In 1950, he was named wholesale manager for the company, and from 1951 to 1953 he served as general manager of the coach and aircraft division. He was named director of service in 1954.

This new Western Deluxe roller, available in 1, 1½, and 2-ton models, is equipped with hydraulically operated trailing wheels and a simple easily removed towbar. With the trailing wheels lowered, one man can lift the roller into towing position by the towbar. A simple locking device prevents the steering roll from pivoting during towing. Locking bolts remove the load from hydraulic rams when the trailing wheels are in either the lowered or raised position. For further information write to Western Welding & Mfg. Corp., 2025 W. Clybourn St., Milwaukee 3, Wis., or use the Request Card at page 18. Circle No. 491.





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97 ton atom-smashing coil moved by R. R. Schubert of Butler, Pa. on a Rogers 75 ton capacity I beam trailer.

240,000 lb. synchro-cyclotron was hauled on a 75 ton capacity Rogers I beam trailer.

In this amazing scientific age there is a general inclination to accept progress with little thought as to the vast knowledge, skill and facilities required to attain it.

Take, for example, atomic development. Of basic importance is the scientific research. Next required are the engineering and mechanical operations to translate this knowledge into electrical and mechanical components. Then comes the *problem of moving these heavy, valuable parts to the laboratory.*

Consider the case of the Carnegie Institute's Nuclear Research Laboratory at Saxonburg, Pennsylvania. After a water trip of 3600 miles two expert riggers were engaged to move the atom-smashing coil and synchro-cyclotron from the waterfront to laboratory. Both of them entrusted their precious loads to Rogers Trailers.

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Magazine of Modern Construction

470 Fourth Ave., New York, N. Y.

AVOID LEGAL PITFALLS

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Amended sewer plan was legally adopted

THE PROBLEM: *Owners of land in a proposed sewer-assessment district objected to the improvements. Under Nebraska law, could the village council eleminate part of the proposed territory, including land of the objectors, and go ahead with the plan without a new estimate and new proceedings?*

THE ANSWER: Yes. (Hutton v. Village of Cairo, 66 N. W. 2d 820, decided by the Nebraska Supreme Court.)

Result of fright not an injury

THE PROBLEM: *Claimant and another ironworker were on scaffolding eight stories above ground when it collapsed. Claimant, who jumped to a nearby safe place, suffered only minor physical injury, but sought a workmen's compensation award on the ground that he had suffered a permanent impairment of his nervous system due to the fright and shock resulting from his companion's fall to death on the ground below. Was he entitled to the award on the theory that he had sustained a permanent injury?*

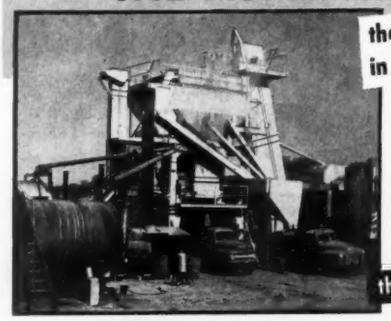
THE ANSWER: No. (American General Insurance Co. v. Bailey, 268 S. W. 2d 528, decided by the Texas Court of Civil Appeals, Galveston.)

A majority of the judges were influenced by testimony of medical experts to the effect that there was no injury to the claimant's brain or nervous system and that the condition was mental rather than physical. But one judge disagreed with the others, being impressed by another medical-expert witness who thought that there was injury to claimant's nervous system.

Delay in furnishing rights-of-way

THE PROBLEM: *(1) Was a highway contractor prevented from collecting damages for delaying furnishing of rights-of-way where no formal demand for them had been made, but where making the demand would have been a useless gesture under the particular circumstances? (2) Did the fact that the contract contemplated possible delays due to unusual weather conditions release the state from liability for delays in furnishing rights-of-way? (3) Did the contractor*

THE ASPHALT PLANT that puts ADDED PROFITS in every asphalt paving job



You can bid advantageously with a MADSEN Model 481 Asphalt Plant on the job. For this outstanding plant has more money-making features than can be found in any other plant of its type. It is designed for quick field erection. It consistently turns out higher daily production under all mix specifications. And, it is designed for easier accessibility and lower maintenance costs. Yes, any way you look at it, the MADSEN Model 481 puts added profits in your asphalt plant operations.

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- Exclusive bin design (Patent Pending) eliminates segregation.
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- Unit construction designed for easy stacking in factory-matched unit sections for quick field erection.

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BLH Construction Equipment Division

waive the damage claim by accepting work orders issued by the highway engineer on the condition that his claim for damages caused by the delay be waived, there being nothing in the contract that authorized the engineer to impose such a condition in issuing work orders?

THE ANSWERS: (1) No. (2) No. (3) No. (Department of Highways of Louisiana v. Morse Bros & Associates, 211 Fed. 2d 140, decided by the United States Court of Appeals, Fifth Circuit.)

On the second question, the court said that it was proved that weather conditions would not have delayed the work during the time that there was delay in furnishing rights-of-way. So, it was intimated that the contractor would not have been awarded damages had he not proved that weather conditions would not have delayed the work.

Material measurement must follow contract

THE PROBLEM: *A subcontract to furnish crushed stone to a road contractor specified: "The quantity of work . . . shall be measured in cubic yards of material used, measured in vehicles at point of delivery." In suing for pay, could the subcontractor prove the quantity of material furnished by showing a different method of measurement?*

THE ANSWER: No. (Ward v. Smith, 86 S. E. 2d 539, decided by the West Virginia Court of Appeals.)

The court said that the subcontractor could not refute the measurements made according to contract requirement by measuring the area at the quarry from which the solid stone had been removed. The court reasoned that the contract method made it equally possible for the parties to check the quantities. Having agreed upon the method, the subcontractor could not complain of the expense involved in making and recording quantity counts. He did not support by proof a charge that the contractor's count was fraudulent.

Deviation from standard government-contract forms

THE PROBLEM: *Government regulations provided for use of standard forms for construction contracts. Did that invalidate a contract that departed from the standard form in regard to liquidated fixed damages for delayed performance by the contractor?*

THE ANSWER: No. (Hartford Accident & Indemnity Co. v. United States, decided by the United States Court of Claims.)

The contracts in question were on "W. D. Contract Form No. 2" and were issued by the War Department on a theory that they were authorized by executive order.

The court cited a decision of the United States Supreme Court that "No statutory language or policy forbids the government and a contractor from stipulating for liquidated damages in limited situations only."

Liability of surety

THE PROBLEM: *A building contract was signed one month before a performance bond, required by the contract, was given. It was mutually understood, however, that the contract should not become effective until the bond was given. Could the surety avoid liability on the ground that there was no "consideration" for the bond?*

THE ANSWER: No. (Lutz v. Porter, 112 Atl. 2d 480, decided by the Maryland Court of Appeals.)

The court said that giving of the bond was one of the considerations of the building contract.

Crane-truck accident

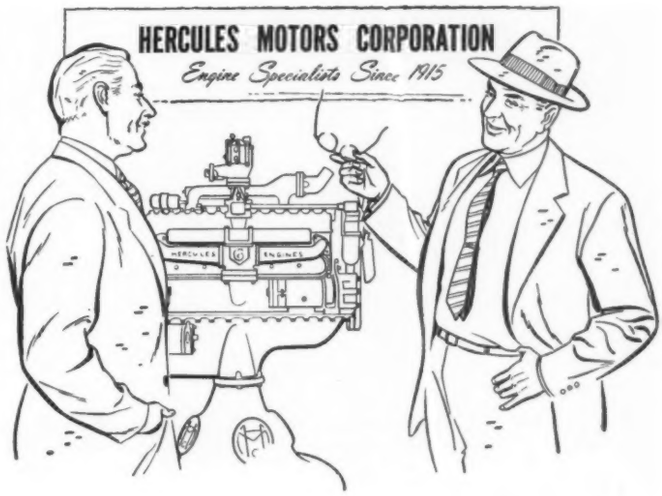
THE PROBLEM: *A crane company rented a revolving truck-mounted crane to a contractor and permitted its officer to operate it. The officer was subject to orders of the lessee, who paid his wages and carried him as an employee. A regular employee of the lessee was fatally injured when crushed between the back of the cranehouse and the back of a truck. Was the crane company liable in damages?*

THE ANSWER: No. (Dicenzo v. New York Shovel & Crane Corp., 122 N. Y. Supp. 2d 879, decided by the New York Supreme Court, Appellate Division, Second Department.)

The court decided that: (1) the operator of the crane, although one of the crane company's officers, was, for the time being, an employee of the lessee, and (2) the operator was not negligent because he was not in a position where he could see behind the cranehouse, and the noise of the crane's operation was loud enough to warn the injured man that it was being operated.

Sales-tax liability

THE PROBLEM: *In performing construction jobs for the federal government, the State of North Dakota, and its political subdivisions, a contractor bought cement, steel, iron, equipment, glass, paint, lumber, and other construction supplies, all of which became part of the real estate upon which the structures were built. Were*



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the materials subject to North Dakota sales taxes?

THE ANSWER: Yes. (Northern Improvement Co. v. Engen, 68 N.W. 2d 463, decided by the North Dakota Supreme Court.)

Injuries to minors

THE PROBLEM: *Under the statutes of Wisconsin, may a property owner be sued jointly with a contractor for injury to a trespassing child attracted to premises on which employees of the contractor, in the course of work, have left open the drum of a mixing machine, exposing the revolving blades?*

THE ANSWER: Yes. (Nechodomu v. Lindstrom, 69 N. W. 2d 608, decided by the Wisconsin Supreme Court.)

The decision is based upon a theory that leaving a machine in such condition as to expose children to the temptation of meddling with it constitutes a nuisance, and that an owner does not escape responsibility for negligent acts of an independent contractor where the nature of the work creates danger.

Suit for haulage charges barred by time limit

THE PROBLEM: *Under a statute, the California Public Utilities Commission fixed minimum haulage rates alternatively upon an hourly or tonnage basis. The plaintiffs, who hauled highway-construction materials for defendants, were paid according to the hourly rate, but they later sued to collect the excess of pay on a tonnage basis. Since there had been no written contract, was the suit barred because it had not been started within two years, the time limit fixed by California statute for suing on an oral contract?*

THE ANSWER: Yes. (Gardner v. Basich Bros. Construction Co., 281 Pac. 2d 521, decided by the California Supreme Court, and setting aside a contrary decision by a lower court.)

Oral contract is invalid

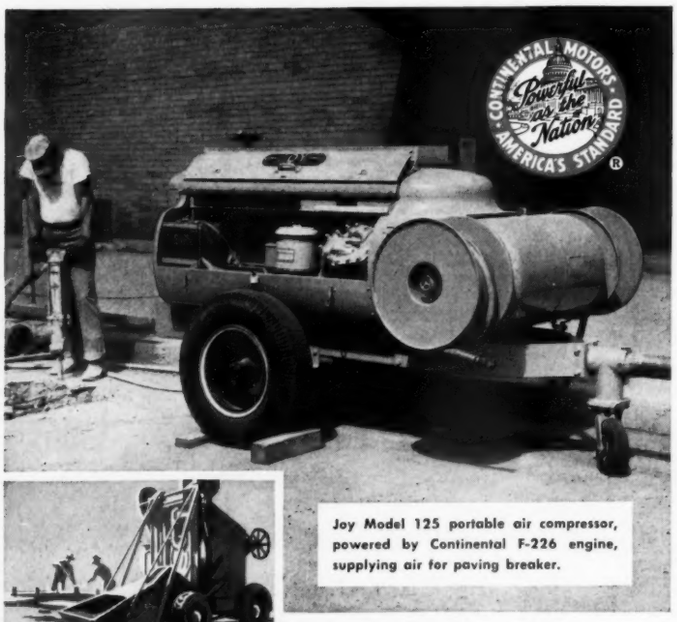
THE PROBLEM: *A general contractor orally agreed to sublet the work of removing dirt from drainage canals. Although it was understood at the time that a written contract would be made, none was ever drawn up. Could the subcontractor hold the general contractor liable in damages for refusing to carry out the oral agreement?*

THE ANSWER: No. (Breaux Brothers Construction Co. v. Associated Contractors, Inc., 77 So. 2d 17, decided by the Louisiana Supreme Court.)

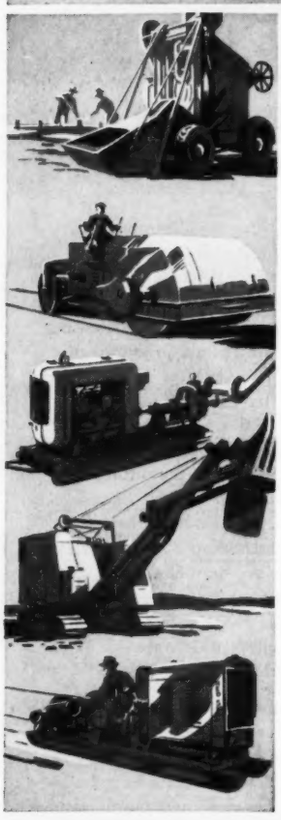
The court stated an ABC rule of law recognized by all courts when it said that where negotiations contemplate that a written contract will be drawn up and signed, neither party is bound until that has been done.

Lateral subsidence in excavating site

THE PROBLEM: *In Minnesota, as in most states, a landowner may excavate to his boundary line but must*



Joy Model 125 portable air compressor, powered by Continental F-226 engine, supplying air for paving breaker.



Speed the Job ...Cut the Cost with DEPENDABLE RED SEAL POWER

Continental Red Seal power is saving money for owners of specialized equipment in all phases of the construction industry. You find Red Seals of varying sizes and specifications (14 to 237 horsepower—for operation on all standard fuels) in more and more leading makes of compressors, mixers, rollers, pumps, shovels, winches, and other machines at the job site. And you find them delivering their full work quota, with a minimum of down time, because each is engineered expressly for its job—built to do one thing and do it well.

SERVICE FACILITIES AND GENUINE RED SEAL PARTS AVAILABLE EVERYWHERE

Continental Motors Corporation
MUSKEGON • MICHIGAN

6 EAST 45TH ST., NEW YORK 17, NEW YORK • 3817 S. SANTA FE AVE., LOS ANGELES 58, CALIF.
6218 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 910 S. BOSTON ST., ROOM 1008, TULSA, OKLA.
1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.

PUTTING A ROAD IN ITS PLACE

This 18-inch line of Naylor Spiralweld pipe was installed to place more than 500,000 cubic yards of sand and gravel for a highway fill. The light weight of this distinctive pipe simplified installation at the new road level. At the same time, the extra strength and safety built into the Naylor structure assured the trouble-free delivery of the sand and gravel required.

For dredging, for high and low pressure air and water lines, for vent pipe and other construction services, Naylor offers the perfect combination with Naylor Spiralweld pipe and Naylor Wedge-Lock couplings. Write for Bulletin No. 507.

NAYLOR PIPE
NAYLOR PIPE COMPANY
1270 East 92nd Street, Chicago 19, Illinois
Eastern U. S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York

guard against subsidence of the adjacent land in its natural condition. To solve a drainage problem, defendants excavated along the boundary of the plaintiff's land, leaving a ledge to support that land at its natural level. Because there had been artificial filling on plaintiff's land, the soil in the upper part of the bank eroded and undermined plaintiff's driveway, making it unsafe. Was plaintiff entitled to require defendants to remedy the situation?

THE ANSWER: No. (Olson v. Mullen, 68 N. W. 2d 640, decided by the Minnesota Supreme Court.)

The court said that defendants were bound to support, as they did, as much of plaintiff's land as was in its natural state, but not that part of the soil that had been disturbed by an "act of man."

Court rules against unlawful picketing

THE PROBLEM: *Union building workers did not attempt to persuade nonunion workers on an apartment-house job either to quit the job or to join the union, but they picketed truck approaches to the job site and persuaded the drivers not to deliver needed materials. The owner and the contractor were unable to induce the suppliers to fulfill their contracts to deliver. Nor could they obtain materials elsewhere. Since there was no dispute between the contractor and its employees, were the owner and the contractor entitled to an injunction against the picketing?*

THE ANSWER: Yes. (Baderak v. Building and Construction Trades Council, 112 Atl. 2d 170, decided by the Pennsylvania Supreme Court, one justice dissenting.)

The court said that the picketing being directed against the employer and not the employees in an effort to enforce unionization of the employees violated a Pennsylvania statute, and since economic loss to the owner and the contractor would result, the injunction should be granted.

Subcontractor's right on contractor's bond

THE PROBLEM: *Under Massachusetts law, must a subcontractor on construction work for a city or town file notice of claim in the clerk's office within sixty days after ceasing to furnish labor or materials in order to be protected by the general contractor's statutory bond given to the municipality?*

THE ANSWER: Yes. (Armco Drainage & Metal Products, Inc. v. Town of Framingham, 123 N. E. 2d 471, decided by the Massachusetts Supreme Judicial Court.)

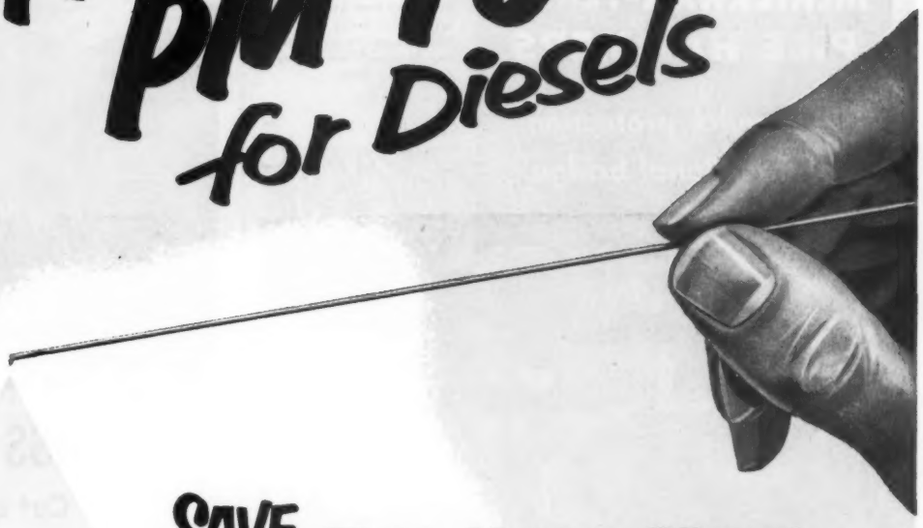
Highway contracts

THE PROBLEM: *Under Florida law, may a state-highway project be awarded in sections to different contractors?*

THE ANSWER: Yes. (Webb v. Hill, 75 So. 2d 597, decided by the Florida Supreme Court.) THE END.

THE ADDITION of the Model 75 front-end loader to its line of ditching and trenching equipment has been announced by the Badger Machine Co., Winona, Minn. The new model has a loading height of 8 feet with a 153-degree bucket tilt. It is shown here on a Minneapolis-Moline R. T. I. tractor equipped with a Model 80 RTM-55 Hopto digger. For further information write to the company, or use the Request Card at page 18. Circle No. 440.

A New PM TOOL for Diesels



SAVE Time, Money, Oil and Engines with the Shell ADC* Oilprint Analysis

Now—operators can test crankcase oil in the short time allotted for re-fueling and oil level checks. The Shell ADC Oilprint Analysis gives a practical and accurate oil evaluation in minutes.

ADC Oilprint Analysis means big savings when used in your preventive maintenance program . . . gives valuable information on engine and oil conditions. It answers the question "When do I change my oil?" thus eliminating the draining of usable oil and the risk of using oils loaded with contaminants.

See for yourself how the new Shell ADC Oilprint Analysis can save you real money in preventive maintenance. *Trademark

Let us demonstrate how you can use this Service for Your Diesels

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

DISTRIBUTOR DOINGS

LeTourneau-Westinghouse appoints three dealers

New dealers in three states have been added to the roster of LeTourneau-Westinghouse Co., Peoria, Ill., manufacturer of earthmoving equipment.

Vivian Equipment Co., 1606 Grand Ave., Ames, Iowa, will serve counties in the western part of the state. Frank H. Vivian, head of the firm, is assisted by D. J. McDonough, sales manager, and Warren Hemingson, service manager. Richard Smith heads the parts-department staff. The firm also handles FWD trucks, Rosco oil distributors, Harnischfeger shovels, and Standard Steel products.

The greater part of Wyoming comprises the territory of Moss Equipment & Supply Co., 310 E. Yellowstone, Casper. Glen Moss is president and general manager of the firm, which also offers sales and service on other lines.

Richmond Machinery & Equipment Co., Inc., 1701 Roseneath Road, Richmond, Va., will serve all but eight counties in the state. The firm has a branch at 3742 Campbell Ave., in Lynchburg.

Two Huber-Warco dealers

Dealers of Huber-Warco tandem rollers, three-wheel rollers, and graders have been appointed in Arkansas and Utah. In addition to the products made by the Marion, Ohio, firm, Euclid-Arkansas, Inc., 702 W. Second St., North Little Rock, handles equipment manufactured by the Euclid Division of General Motors, the Cedar Rapids line of the Iowa Manufacturing Co., and the excavator line of the Bucyrus-Erie Co.

Foulger Equipment Co., 1361 S. Second West in Salt Lake City, the other Huber-Warco distributor, also handles a number of other lines.

Dealer adds Rex line

Rex construction machinery will be distributed in all but three Nevada counties by Pioneer Equipment Co. of Nevada, Inc., Reno, a new firm handling products manufactured by Chain Belt Co., Milwaukee, Wis.

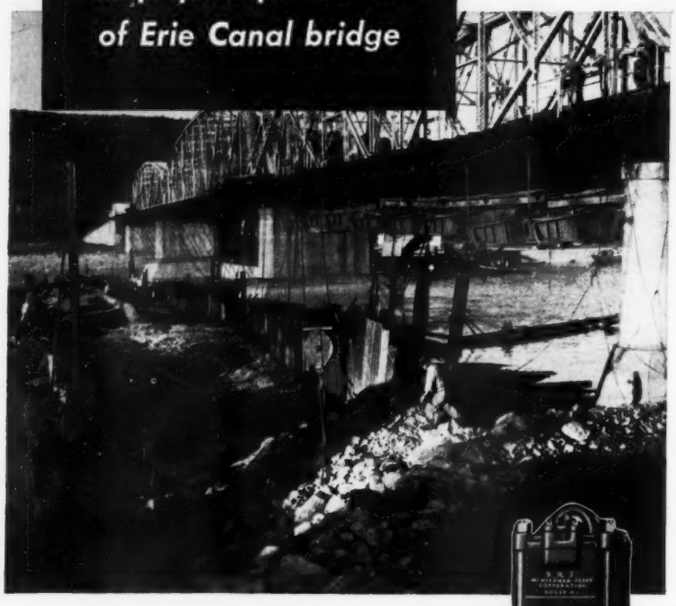
The Rex line of truck mixers, plaster and mortar mixers, pumps, pavers, and related equipment will also be handled by the dealer in Al-

Emergency!

McKIERNAN-TERRY PILE HAMMERS

help quick protection of Erie Canal bridge

Part of steel sheet cofferdam, built by the Canal Maintenance Bureau of N. Y. State Public Works Dept., extending from endangered bridge pier to the river bank above the abutment, and filled with heavy gravel and quarry stone.



A large break in a dam at Lock Nine on the Erie Canal threatened an abutment, pier and superstructure of a nearby bridge because of the huge boulders and chunks of concrete carried by the current through the break.

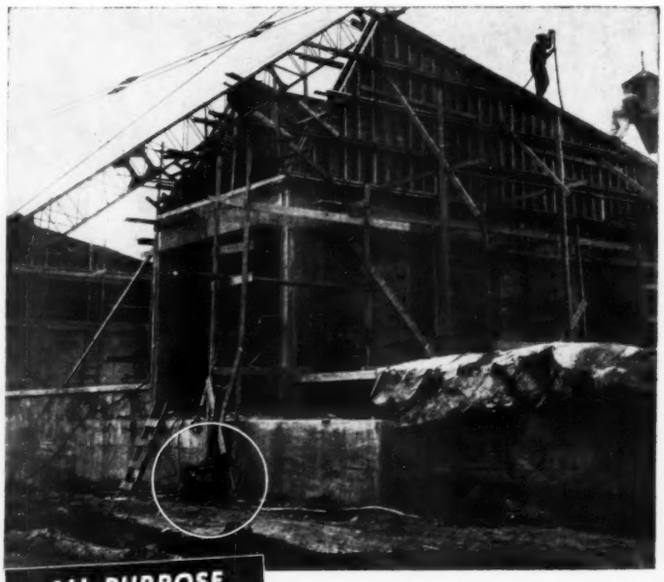
Four McKiernan-Terry Double-Acting Pile Hammers, sizes 5, 7 and 9B3, were used to quickly drive steel sheet piling for a cofferdam constructed to make the emergency repair. Here, as in uncounted other instances, McKiernan-Terry Hammers helped to do an urgently needed job speedily and securely.

Write for bulletins describing the complete McKiernan-Terry line of double-acting hammers and extractors and single-acting hammers for every piling job.

MK 348

McKIERNAN-TERRY CORPORATION

MANUFACTURING ENGINEERS • 82 RICHARDS AVE., DOVER, NEW JERSEY



ALL-PURPOSE

MAGINNISS CONCRETE VIBRATORS

Cut costs on every job!

Whether you're using plastic or stiff mixes, Maginnis Hi-lectric Vibrators will place concrete faster and produce blemish-free finished surfaces.

Powered by a constant-speed 180 cycle 120 volt induction type motor located in the vibrator head for maximum efficiency, Hi-lectrics produce variable frequencies up to 10,500 V P M and maintain constant speed at all times—they do not slow down and lose vibrating effectiveness even under full load in stiffest low-slump concrete! This means you can use all purpose Hi-lectric Vibrators on any job, no matter what the concrete specifications may be.

Because pours are completed faster, labor expense for the entire crew is reduced. One-man operation cuts vibrating costs, too. The Hi-lectric power unit can be located as much as 200 ft. away from the work site—the vibrator operator is free to move about on the forms unhampered by cumbersome, unwieldy flexible shafts. What's more, with blemish-free surfaces, costly hand finishing is eliminated.

Ask your Maginniss distributor to demonstrate on your present job—he'll show you how Hi-lectric equipment can cut your concrete placing costs. You'll find him listed in the Classified Section of your telephone directory.

AA-1826

Simple, rugged construction of Hi-lectric motor-in-head vibrators keeps maintenance costs at a minimum. There are no brushes, commutators or armature windings to burn out.

Maginniss HI-LECTRIC POWER TOOLS

MAGINNISS POWER TOOL COMPANY

154 DISTL AVENUE • MANSFIELD, OHIO

pine, El Dorado, Placer, Nevada, Sierra, Plumas, and Lassen counties in California.

Mid-Western Industries enters sales agreement

Under terms of agreement with Massey-Harris-Ferguson, Inc., Racine, Wis., construction equipment manufactured by Mid-Western Industries, Inc., Wichita, Kans., will be sold and distributed exclusively through Massey - Harris - Ferguson outlets. Complete manufacturing and export distribution rights of Mid-Western's Davis industrial equipment have also been assumed by Massey-Harris-Ferguson.

Chicago dealer expands, adds Buck equipment line

O'Leary's Contractors Equipment & Supply Co., which recently moved into new and larger headquarters at 4554 W. North Ave., Chicago, is a new dealer for the Buck Equipment Corp., Cincinnati, Ohio. Buck hoisting machines — both the trailer-mounted models and the new Pelican truck-mounted units—are being handled by the firm.

O'Leary also distributes Thor tools, Gorman Rupp pumps, Gordon Smith and Schramm compressors, Roeth vibrators, Kamo tools, and Muller mixers.

Clark names six dealers

One Canadian and five American dealers have been appointed to handle the Michigan line of tractor shovels and excavator cranes manufactured by the construction equipment division of Clark Equipment Co., Benton Harbor, Mich.

Serving the province of New Brunswick, Canada, is Barker Equipment Co., Fredericton. In the eastern part of the U. S., West Virginia Tractor & Equipment Co., Charleston, W. Va., will add Michigan tractor shovels to its roster. The company, formerly handling only Michigan excavator cranes, will cover all but seven counties in the state.

Stephens Equipment Co., 818 S. W. Ninth St., Des Moines, Iowa, will cover the central part of the state; R. E. Common Equipment Co., 1515 S. Washington St., Peoria, Ill., will handle west-central Illinois, and Machinery Outlet, Inc., 7333 S. Broadway St., Wichita, will sell and service the line in central and western Kansas.

On the West Coast, Totem Equipment Co., 3706 Airport Way, Seattle, Wash., has been appointed to represent the Clark organization in all but five counties in Washington and in northern Idaho.

Dravo-Doyle Co. names two new executives

The election of C. N. Hollingsworth, Jr., as vice president and J. H. Noble as a director has been announced by Dravo-Doyle Co., Pittsburgh, Pa., distributor of heavy construction equipment and a subsidiary of Dravo Corp., Pittsburgh, manufacturer of concrete-handling equipment and steam hoists.

The new vice president of the distributing firm is also general manager and a director Dravo-Doyle. He has been with the company since 1924. Mr. Noble, sales manager of Dravo-Doyle, has been with the firm since 1928.

New Euclid dealer in South

Products manufactured by the Euclid Division of General Motors Corp., Cleveland, Ohio, will be sold and serviced by the recently authorized dealer, Nash Euclid Equipment Sales, Inc., Salem, Va. The dealership, headed by H. Wilson Nash, will cover the entire state with the exception of a few counties in the northeast.

Worthington outlet

Brinker Supply Co., Dover, Ohio, a new distributor for Worthington Corp., will handle the complete line of construction machinery manufactured by the Harrison, N. J., firm. The dealer will cover the entire Cleveland area.

New Galion dealership

The Galion line of graders and rollers is being handled in 65 counties in Mississippi by the Mississippi Road Supply Co., 1940 N. Mill St., Jackson, Miss. In addition to the equipment manufactured by the Galion Iron Works & Mfg. Co., Galion, Ohio, the dealer handles equipment made by International Harvester, Bucyrus-Erie, Frank G. Hough, M-R-S, "Quick-Way", Tampo, Standard Steel, and Bethlehem.

New Marion dealers

Sales and service on Marion Power Shovel equipment is being offered by a new dealer in Orlando, Fla. Highway Equipment & Supply Co., 1016 W. Church St., which will cover central Florida for Marion, is headed by W. K. Herold, vice president and general manager.

Another Marion dealer is the John W. Patterson Co., 128 Hanover St., Rook Station, Carnegie, Pa. The company will serve western Pennsylvania and northern West Virginia.

performance speaks LOUDER...

Compare this MERTON OVERLOADER production record with your present operation

Project: Loading mixed coal and slack from stock pile to trucks.

Density: 1 cu. yd. equals 1,200 lbs.

Floor: Packed coal, surface uneven and wet.

Bucket: 1 cu. yd.

Data:

No. Truck	Time Min.	Time Sec.	Loading Cycles	Loaded Wt.
1	2	20	8	10,760 lbs.
2	2	04	7	8,320 "
3	2	10	8	9,960 "
4	2	18	8	11,600 "
TOTALS:	8	52	31	40,640 "

Average: 2.31 tons per minute—approx. 138.6 tons per hour!

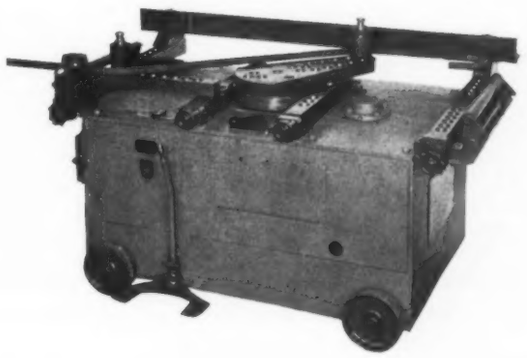
FEATURES INCLUDE:

1. From 40% to 100% faster operation—direct line loading without time-wasting pivoting and manuevering.
2. Variable height discharge from 6'11" to 11' 2".
3. Front end loader advantages with multi-bucket conveyor speed.
4. Diesel power economy.
5. Handles all types of bulk material rapidly and efficiently.
6. Simplicity of operation and design—for big savings in maintenance, operator fatigue, and purchase cost.

FOR COMPLETE INFORMATION AND LOW PRICES, ASK YOUR DEALER, OR WRITE DIRECT.

SEC seaboard equipment co., inc.
7 Hanover Street New York 5, N. Y.

Here's the "PERFECT" Bar Bending Machine

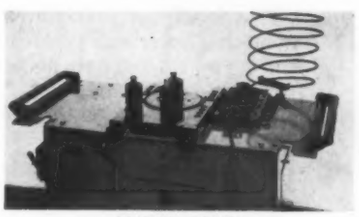


Here is how to save time on your next bar bending job. The "Perfect" Bar Bending Machine can do a better job faster, because of these special features:

- Right and left hand bends can be made without additional adjustment by means of a single control
- Automatic stop and return control provides maximum safety and uniform work
- Adjustable speed so that highest efficiency is assured on every size of bar and any grade of steel
- Will bend spiral rings and curves of any diameter and pitch
- The "Perfect" Bar Bender is available with electric motor or gasoline engine.
- Three models, Nos. 32, 40, and 50 will handle all diameters from 1¼ to 2 inch rounds.

Write for illustrated folder on the "Perfect" Bar Bender and "Simplex" Bar Cutter for your next job.

MULTIPLE BEND



SPIRAL BEND

STIRRUP BEND

KLINGELHOFER MACHINE TOOL CO.
INDUSTRIAL PARK, KENILWORTH, NEW JERSEY

M-R-S names dealer for Michigan area

Sales and service on the complete line of products manufactured by the M-R-S Mfg. Co., Flora, Miss., will be offered by the W. H. Anderson Co., Inc., Detroit, Mich. Located at 47 W. Seven Mile Road, Detroit, the Anderson organization will serve the Michigan area.

M-R-S manufactures heavy diesel wheel tractors ranging from 210 to 335 horsepower.

Metalweld adds Hough line of construction machinery

The MW Construction Equipment division of Metalweld, Inc., Philadelphia, Pa., is a new exclusive distributor for the Frank G. Hough Co., manufacturer of the Payloader, wheel tractor shovels, and industrial tractors. Metalweld will handle sales and service for the Hough line in eastern Pennsylvania, and southern New Jersey, and will also cover New Castle, Del.

Texas dealer to handle Cleaver-Brooks equipment

The Cleaver-Brooks Co., Milwaukee, Wis., has appointed the Powell Equipment Co., Houston, Texas, to handle its line of oil, gas, and combination oil and gas-fired stationary boilers, mobile steam boilers, distillation equipment, evaporators, and oil and gas burners.

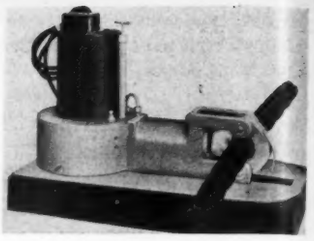
Located at 7623 Greenstone, Houston, Powell will service 29 counties in southeast Texas.

Heil dealer for Mexico

Bowyer Motor Co., Inc., Stone and Mabel Streets, Tucson, Ariz., is now distributing Heil truck body and hoist equipment in Mexico. The dealer is representing the Milwaukee firm in the states of Sonora, Sinaloa, and Baja.

New Nordberg dealer

Tractor & Equipment Co., 201 N. Central St., Sidney, Mont., will cover parts of Montana and North Dakota for Nordberg Mfg. Co., Milwaukee, Wis. The dealer has branches at Glasgow and Miles City, Mont.



The new Model M Hydrashear wire-rope cutter.

Wire-rope cutter is electrically powered

■ A new electrically-driven cable cutter has been added to the Hydrashear line made by the Pell Cable Cutter Co., 407 Sharon Bldg., 55 New Montgomery St., San Francisco 5, Calif. This new portable unit is reported to cut up to and including 2½-inch super plow-steel wire rope in 50 seconds.

Powered by a ½-hp 110 to 220 volt single-phase ac motor directly connected to a wobble-type hydraulic pump, the cutter plugs directly into any electric circuit. No special wiring is required. Pump pressure developed is 10,000 psi.

The Model M Hydrashear is furnished with a steel base plate, skid-mounted for shipping, or ready for mounting on dolly, truck, or casters. It measures 16 inches wide, 33 inches long, and has an over-all height of 20 inches.

For further information write to the company, or use the Request Card at page 18. Circle No. 504.

Engines have new features

■ All engines manufactured by Kohler Co., Kohler, Wis., are now available in standard models with features that were formerly offered optionally. The new P models—with threaded crankshafts for direct mounting to pumps—now include valve rotators, stellite-faced exhaust valves, and exhaust-valve seat inserts as standard equipment.

Model designations for the new series are K90P, developing 3.6 horsepower; K160P, 6.6 horsepower; K330P, 11.8 horsepower; and K660P, 26.8 horsepower.

The company will also continue to offer these four engines with hand clutch, electrical starter, retractable starters, direct mount, and reduction gears.

For further information write to the company, or use the Request Card at page 18. Circle No. 414.

MORE PULL WITH LESS FUEL!

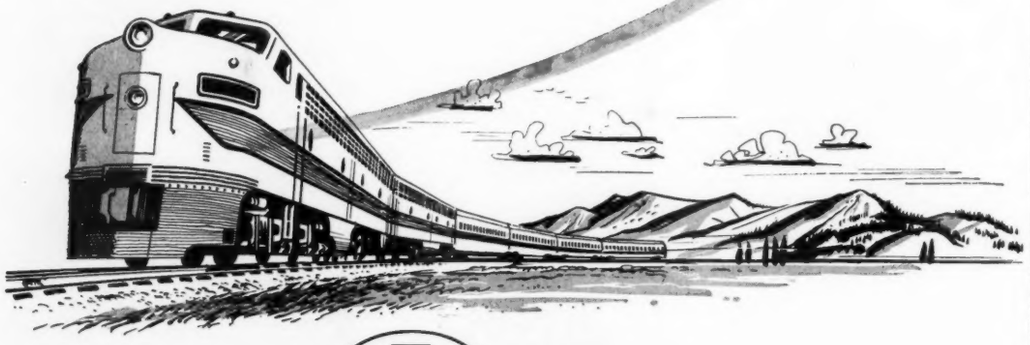
AiResearch Turbochargers provide rapid response to acceleration demands... end objectionable smoking!

Consider what the application of AiResearch Turbochargers to diesel locomotives will accomplish: A team of these small power packages will provide a greater increase in power at smaller cost in space and weight than any comparable turbocharger or supercharger installation.

In addition, specific fuel consumption on a horsepower per hour basis will be far less. Sea level performance will be restored within operating limits at altitude, response to acceleration demands will be rapid and excessive smoking under operating power eliminated. Also, the noise level will be greatly reduced.

Application in other fields will be equally effective, as has already been demonstrated in the remarkable results achieved by the installation of AiResearch Turbochargers on Caterpillar diesel machinery.

AiResearch is the largest producer of small turbomachinery in the United States, with twenty-five *million* hours of experience. This unmatched experience explains why AiResearch Turbochargers lead in power, economy and dependability. Your inquiries are invited.



THE GARRETT CORPORATION

AiResearch Industrial Division

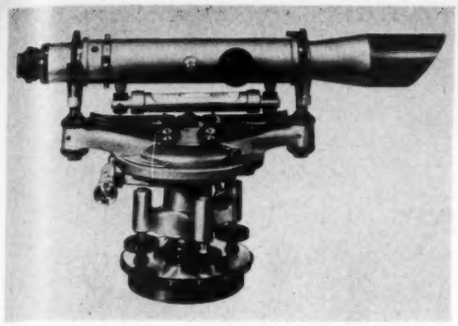
9225 Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

INVEST IN

U. S. DEFENSE BONDS

NOW EVEN BETTER



The Warren-Knight Model 40 convertible level.

New features added to convertible level

■ The new Warren-Knight Model 40 convertible level has eight new features. A new cast-brass internal focusing telescope is completely sealed against dust and dirt, and employs 24 power-coated optics with cross-wires on a glass reticule.

Other new time-saving features include a circular level mounted on the top plate cover, which enables a quick check to be made on the instrument setup, and a fast level-position approximation. A nylon pinion bearing, a steel center, and a level bar, cast in one piece with the circle cover, are designed to decrease maintenance of the instrument. A cover glass protects the circle and vernier graduations.

A new eyepiece cap with a resetting scale enables the user to quickly reset to his individual need without even using the telescope.

For further information write to Warren-Knight Co., 136 N. 12th St., Dept. I, Philadelphia 7, Pa., or use the Request Card at page 18. Circle No. 547.

Crack filler unaffected by temperature changes

■ A new rubberized compound for sealing cracks and joints in concrete and bituminous resurfaced pavements is announced by Keystone Asphalt Products Co., 101 E. Ontario St., Chicago 11, Ill. Kapseal crack filler is said not to become brittle or crack during cold weather.

The filler adheres to pavement surfaces, maintaining its bond through successive cycles of expansion and contraction. Only a conventional asphalt melting kettle and hand pouring pots are required to apply the new filler.

For further information write to the company, or use the Request Card at page 18. Circle No. 497.

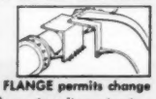
"We can't give you a raise; but I'll tell you what—we'll put your name on the door. . . ."

for compacting earthfills

SELECT SOUTHWEST

Southwest compaction roller

5 SIZES WITH WEIGHT CAPACITY FROM 10 TO 100 TONS

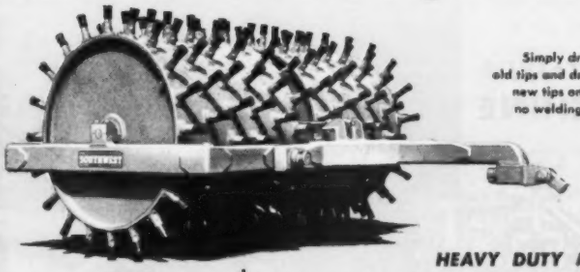


ADAPTER FLANGE permits change of draft beam to suit any tractor.

FEATURING:

1. Greater wheel oscillating freedom with each wheel mounted in an independent weight box unit.
2. Heavy duty, reinforced gooseneck and sectionalized hauling yoke.
3. Swivel hitch with Timken roller thrust bearing.
4. Each wheel equipped with two large Timken bearings.
5. Sectionalized hauling yoke permits use of 2 to 6 wheel units.

Southwest sheepsfoot roller



Simply drive off the old tips and drive on the new tips on the job—no welding required.

HEAVY DUTY MODELS FEATURING:

11 SIZES WITH WEIGHT CAPACITIES FROM 5 TO 20 TONS

WRITE TODAY for illustrated folders giving complete data and specifications.

1. Full oscillating double drums.
2. Timken roller thrust bearing at oscillating pins.
3. Two-piece foot with replaceable tips—permits changing size or replacing tip in the field without welding.
4. One-inch steel drum shell.
5. Heavy duty, reinforced box steel frame.
6. Large swivel hitch with Timken roller thrust bearing.

Southwest Welding & MANUFACTURING CO.
CONSTRUCTION MACHINERY DIVISION
ALHAMBRA, CALIFORNIA

1. Simulating actual field conditions, students in the Construction Technology Department of the New York City Community College set reinforcing steel (heavy wire) and column forms for a scale-model reinforced-concrete building.
C&E Staff Photos

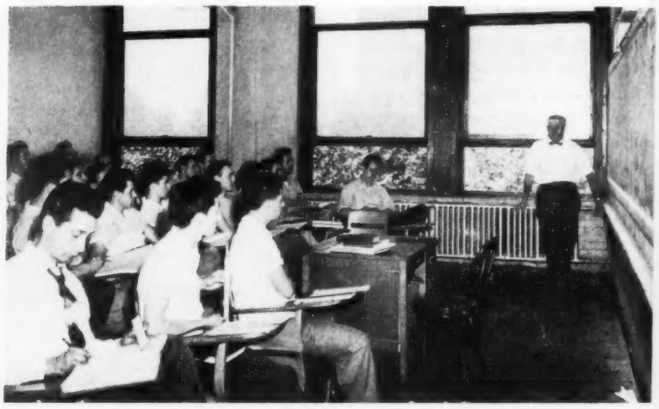
2. Once the columns and second-floor slab have set, forms are stripped. Air spaces in concrete or uneven column surfaces indicate poor vibration during pours. Note clusters of reinforcing steel protruding from slab above columns.

Training the field technician

Schools and the construction industry are alarmed about the present lack of trained technologists; here's what's being done about it in one area

The shortage of trained engineers for the heavy-construction industry in this country is being viewed with increasing alarm, both because of Soviet Russia's strong threat to outstrip us in this technical manpower race and because of the growing vol-

4. Field trips to actual construction projects are a regular part of the department's program. Here a group of students, with instructor Martin A. Stempel (in T-shirt), studies blueprints and column reinforcing on a nearby building job.



5. Theory has its place in a technical school, too, and a good part of the department's curriculum consists of classroom lectures. About 275 students were enrolled in day classes last year, with nearly 450 others attending evenings.

You don't have to stop traffic . . .

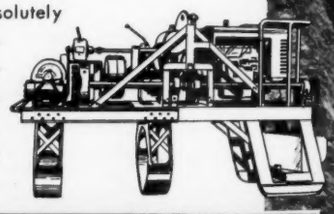
. . . to bore road crossings

with the **CROSE** auger-type

ROAD BORING MACHINE

Installs casing as boring progresses — eliminates cave-ins. Absolutely prevents settling of concrete slab highways or railroad beds. Extremely accurate in alignment. Available in three models for casing sizes up to 42".

Send for Catalog CE-355



M.J. Crose Manufacturing Co., Inc.

2715 DAWSON ROAD • TULSA, OKLAHOMA

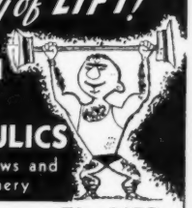
15225 EAST COLFAX AVE., AURORA, COL. • 500 FIFTH AVE., NEW YORK CITY

DISTRIBUTORS: CROSE-CURRAN LTD., EDMONTON • CROSE PIPELINE EQUIPMENT CO., INC., NEWARK, N. J. • PIPELINE SUPPLY CO., HOUSTON

Plenty of **LIFT!** with

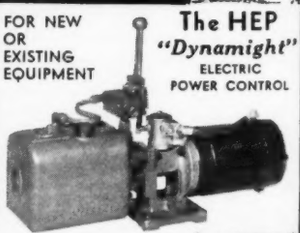
MONARCH POWER HYDRAULICS

for Snow Plows and Road Machinery



FOR NEW OR EXISTING EQUIPMENT

The HEP *"Dynamight"* ELECTRIC POWER CONTROL



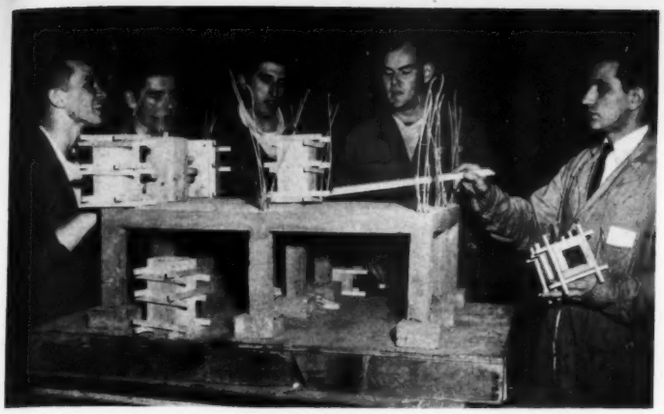
FITS ALL TRUCKS — is FAST and EASY to Install

Available for 6 or 12 Volt Systems

1000 lbs. pressure
1 gal. per minute volume

Fan Belt Models Also Available.

MONARCH ROAD MACHINERY CO. 1111 MICHIGAN ST. N.E. GRAND RAPIDS 1, MICH.



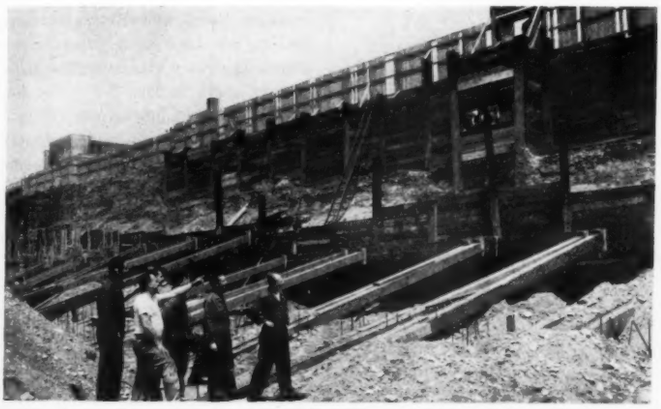
3. Instructor Peter Karalis (right) illustrates a step in preparing forms for second-floor column pours. Although students will become supervisors and technical assistants, they are also trained in actual construction.

ume of day-to-day peacetime construction.

Not so widely recognized is the growing need for construction technologists — trained personnel below the engineering level—and supervisory personnel. Though not given the professional status of engineers, these members of one of the nation's largest industries are vitally important to every construction project.

Here, too, Russia is presenting a formidable manpower threat. Accord-

(Continued on next page)



6. Instructor Stempel and a group of students take a tour of a big excavation job. Here they study shoring at one side of the cut, outside of which runs a busy thoroughfare. Job superintendents always cooperate with these visits.

Konkure Concrete Curing Compounds

For twenty years never a City, County, State or Federal test failure . . . *There must be a reason!!*

YOU PAY NO MORE FOR THE FINEST OF CONCRETE CURING COMPOUNDS

★ *KONKURE NOW OFFERS:*

- Clear—Black-Gray and White Pigmented-Resin Tilt-Up . . . Specified in Original Bureau of Reclamation Specifications.
- Concrete Sawing, Joint Filling and Curing Application for Airports, Highways, Commercial, Engineering Projects.
- Specify KONKURE . . . Specify the Cadillac of Concrete Curing Compounds.

★ *OTHER KONKURE PRODUCTS . . .*

- KONSET . . . A Hardener and Stabilizer for Topping and Bonding Old Concrete to New.
- KOLORBLEN . . . Concrete Coloring . . . A Variety of Colors.
- SERVICISED EXPANSION BOARD . . . Full or Cut.
- RUBBER WATER STOPS . . . PARA-PLASTIC Joint Sealer, Regular and Para-Plastic JFR.
- Western States Distributor for Block Mesh.

WRITE TODAY FOR FULL INFORMATION

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KONKURE COMPANY

Concrete Curing and Application

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THIS can help give you a real competitive advantage on jobs like THIS

New 10,500 ft. runway for heavy bombers at Westover Air Force Base. AJAX Cups imprinted with safety messages and AJAX drinking water equipment were used on this job.

Safety messages *that get read* do help reduce accident rates. The National Safety Council confirms this. And a good safety record *with resultant lower insurance costs* can give you a competitive advantage on today's close-figured jobs.

That's why so many cost-wise contractors are using AJAX safety-imprinted Cups and Drinking Water Tanks.

They not only take fresh, clean water economically to men in the field, but also put approved safety messages right in workers' hands several times a day, at moments when they are relaxed, receptive, ready to read.

AJAX® CUPS and Drinking Water Tanks deliver fresh water to workers — mean less time lost on the job. AJAX Cups and Dispensers are also ideal for stationary tanks, barrels, pipeline faucets. 4 oz., 6 oz. and 7 oz. sizes packed imprinted with assorted stock safety messages — or your own message to order.

A TYPICAL EXAMPLE

(Actual case history from insurance company files)

Contractor A paid a first year premium of $22,600. His second year he paid $12,748 — $9,852 less. $3,700 of this reduction was due to a difference in his manual rate — *but he saved an additional* $6,152 because an active accident prevention program earned him a substantial credit on his second year premium.

GET THE FULL STORY—Write us today for this new folder which gives full details on imprinted AJAX Cups and equipment.

United States Envelope Company

General Offices: • Springfield 2, Mass.

15 DIVISIONS FROM COAST TO COAST

C-2C

Labor and Time Savings on the Job!

HANDLE MANY JOBS WITH THESE ATTACHMENTS

Strike-off Box Attachment. For road widening fill and asphalt paving. Adjustable on three sides to 6" above grade. Strike-off blade extends 4'. Remove with one pin.

Conveyor Extension Attachment permits backfilling 24" high curb or placing material over 7' from wheels. Take-off drive. Unit is 4' long with independent belt.

POWER-PACK BACKFILLER

Performance proved! Everywhere POWER-PACK has been used great savings result in labor and time . . . also you can expect a better fill with no material wasted!

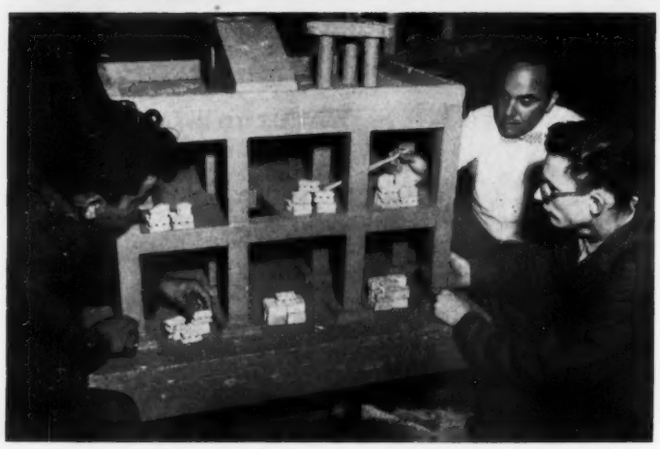
Only one man operating the POWER-PACK can power-backfill curbing, trenches, and pipelines at the rate of *three tons per minute!* This equipment has actually paid for itself on a single job.

Ruggedly built for long service. Easily portable with four swivel wheels and a sure, quick hitch. Can be used with any size dump truck including trailer dumps. Dependable 8.25 Wisconsin engine. Heavy duty belt.

To save time and money investigate POWER-PACK today! Write for booklet or phone your distributor.

POWER-PACK CONVEYOR CO.

13910 Aspinwall Avenue Cleveland 10, Ohio



7. Reminiscent of a child's building toys are these miniature concrete blocks stacked in the bays of a scale-model reinforced-concrete building. Used for curtain walls and other items, the blocks are made by students in the laboratory. *C&E Staff Photos*

8. Steel fabrication courses include the use of arc welding and cutting torches. Structural steel design and detailing courses are also offered in a curriculum which breaks down the entire construction field into 24 separate subjects.

How much does it cost you to keep the clutch pedals?

The figures are right on your books. Just add the charges of all those clutch replacements – of all their repairs – of all overhauls of overtaxed engines – of all the extra service work on axles and drive-lines damaged by shock-load starts.

And remember – these "fixed" costs are eating chunks out of your profits no matter what kind of standard-shift trucks you use or how much clutch-and-shift skill your drivers have.

These costs will shrink with Hydra-Matic GMC's*

With self-shifting GMC's, you not only reduce those expenses – but cash in on reduced down time and longer truck-life to boot.

And you can now have all Hydra-Matic's timesaving – effort-saving – truck-saving advantages...

– in 65 new Blue Chip models ranging up to 70,000 GCW

– in 7 two-cycle Diesel models from 30,000 GVW to 70,000 GCW

– in 15 new dual-purpose cab models from 16,000 GVW to 55,000 GCW

– in 9 c.o.e. "Stripaway" models from 32,000 GVW to 70,000 GCW

– in 9 rugged new tandem-axle models from 28,000 GVW to 70,000 GCW

– teamed with a wide choice of Blue Chip power plants – sixes, V8's and Diesels – from 125 to 230 h.p.

– in Blue Chip GMC's with greater-than-ever ruggedness

– improved turning ability

Get full details on any one of them – right now – at your GMC dealer's!

**Hydra-Matic standard on many models; optional at extra cost on some others*

GMC TRUCK & COACH – *A General Motors Division*

BLUE CHIP GMC TRUCKS

Your Key to Blue Chip Value

See GM Diesels at work at the
GENERAL MOTORS
POWERAMA
Lake Shore Drive, next to Soldier Field, Chicago
August 31 through September 25

(Continued from preceding page)

ing to figures reported by *The New York Times* in a feature article carried on November 7, 1954, the Soviet has an estimated 3,700 intermediate technical training schools with a combined enrollment of 1,600,000. In contrast, the United States has approximately 1,000 such two-year institutions with a total enrollment of slightly under 50,000.

Communist China is also concentrating on this two-year technical training program; latest figures show she is graduating 25,000 students a year from two-year engineering schools.

The free world is beginning to realize that such technicians—as well as full-fledged engineers—have an important contribution to make both to our security and to the preservation of our democratic prosperity. In Britain, strong emphasis is being placed on an apprentice training program. Young men interested in construction are encouraged to start work as young as 16 or 17, and they are given opportunity to study part time for a technician's certificate or degree.

Apprentice program

The Associated General Contractors of America, Inc., this nation's largest society of contractors, has recently stepped up its apprentice program to meet the increasing need. Members work on the local level with high schools, vocational counselors, and through such communication media as the radio, TV, and the press to point out to young men the advantages of a career in construction.

Some attention is at present being focused on the supervisory needs of the construction picture, as the editorial on page 4 of this issue points out.

The increasing concern over filling the manpower needs of the construction industry is based on reliable predictions that, by 1970, the volume of building will have increased by one-third. This prediction is, in turn, based on expectations that by 1970 the population of this country will have reached 200 million—an increase of 35 million.

Now this population growth will necessitate an expansion of heavy construction, and an impressive number of tradesmen, technicians, and supervisors—not to mention engineers—will figure in the picture. Hence the present concern over the available manpower.

CONTRACTORS AND ENGINEERS recently took a survey of construction technology courses being offered in six schools in the metropolitan New York area. Five of the six are accredited universities or colleges with regular departments of civil engineering, while one is a two-year technical school with a department of construction technology. Nearly all offer courses not only to the matriculated student but to working men who wish to avail themselves of evening classes.

The Construction Technology Department of the New York City Community College, in Brooklyn, directly serves the needs discussed in this article. This past school year, 275 day students and more than 400 part-time (evenings and Saturdays) students attended courses in the practical aspects of construction operations. After two years, full-time students are awarded an Associate in Applied Science Degree in Construction Technology.

Both lectures and laboratory work are emphasized in the department, and frequent field trips to actual construction projects are part of the curriculum. Courses include Construction Techniques; Estimating; Structural Steel Design, Detailing, and Fabrication; Reinforced - Concrete Design; Highway Construction; and many others.

Good positions

Graduates of the Construction Technology Department obtain positions as structural, architectural, or engineering draftsmen; steel or concrete detailers; assistant construction superintendents; assistant surveyors; concrete inspectors; estimators; and junior civil engineers. The department places almost 100 per cent of its graduates.

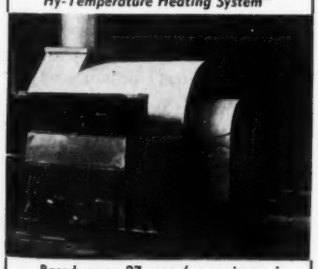
Here, as in the technology courses offered at the other five institutions, the emphasis is on training young men for jobs as assistants to engineers and other professionals in the field. This is not training for a trade, but rather a sub-professional program to turn out technicians who know their job and can step into positions of responsibility.

In the College of Engineering at

(*Concluded on next page*)

The Community College library has a wide selection of technical reference books and periodicals for the student's use. The shelves at left background contain trade publications in all the fields taught at the school, including construction.

Modernize your plant with a "Meadows Hy-Temperature Heating System"



Based upon 27 years' experience in the manufacture and operation of Hot Oil Heat Transfer Systems, we present a new revolutionary, portable hot oil heating system for industrial application:

Features

Maintains temperatures up to 600°F.
Very low operating pressure.
No freeze ups.
Highly efficient.
All oil in heating zone in constant and positive circulation. No pockets of oil to become overheated and decomposed.
Automatic in operation with highest grade safety controls.
No licensed engineer needed for operation.
Portable—self-contained — mounted on skids. Can be easily moved.
Each installation given our personal supervision.

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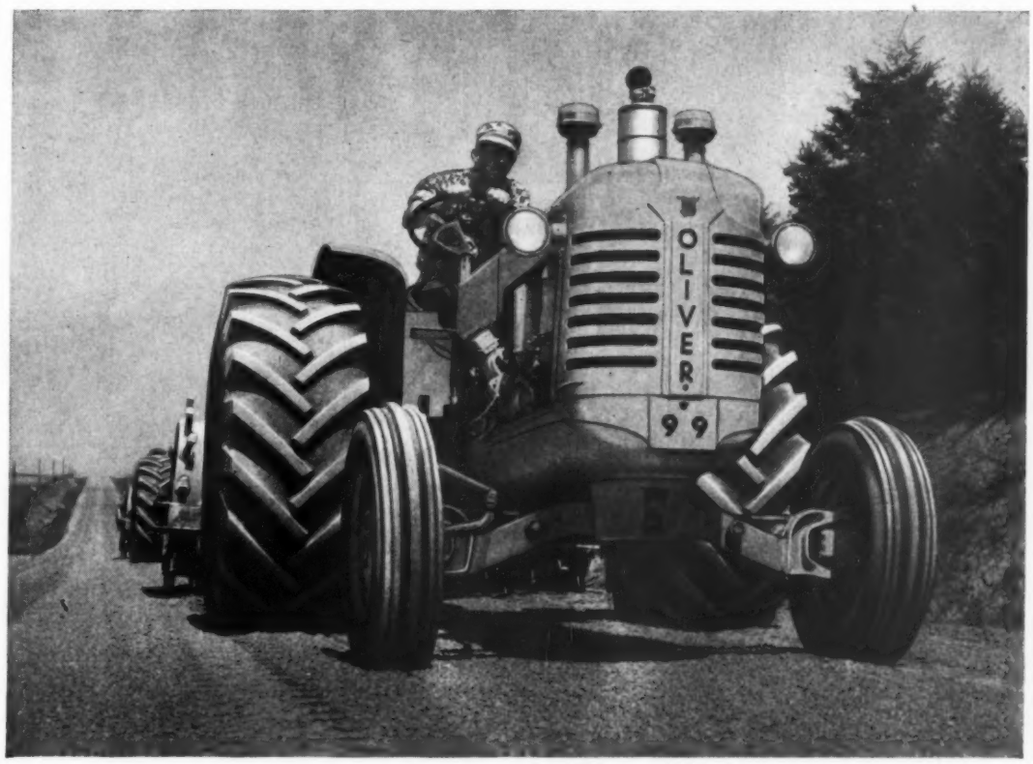


Big new Oliver Super 99 GM Diesels show power, speed on Iowa road job

Look under the hood of the new Oliver Super 99 GM and you'll find a brand-new kind of tractor power—famous 2-cycle General Motors diesel delivering 72 horsepower on the drawbar. Never before so much power in a general-purpose wheel tractor!

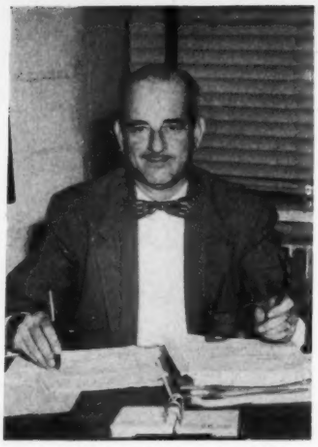
Concrete Materials Company, Cedar Rapids, Iowa, owns five of these new Oliver GM's. Two are shown here pulling double sheep's-foot tampers, preparing black-top base for a new road. Width of the base is only 23 feet, but with a 10'1" turning radius, these tractors turn around without hesitation, without slowing down!

So much power is there in this new Oliver that these two tractors were able to operate mostly in fourth gear, even when pulling 18,000-pound pneumatic finish rollers. Frank Stotts, Superintendent for Concrete Materials Company, put it this way: "The Super 99 GM's are a dream . . . they do the best job of any wheel tractor I have ever been around."

Operating this new tractor is a dream, too. Fuel and upkeep costs are way low, and you'll find six forward speeds, comfortable seat and platform, finger-tip ball steering, differential disc brakes—features that boost production, cut fatigue, make every job go faster, easier. See your Oliver Industrial Distributor for a demonstration.

THE OLIVER CORPORATION
400 West Madison Street, Chicago 6, Illinois

OLIVER a complete line of industrial wheel and crawler tractors



Joseph Steinberg, head of the Construction Technology Department at Community College.

(*Continued from preceding page*)

New York University, the curriculum includes a course in Construction Engineering, which takes in the practical aspects of field operations. In addition, evening courses open to any interested adult treat such subjects as Introduction to Building Construction, Basic Structural Principles, Estimating Principles and Practices, Structural Design, Business Problems of Building Construction, and Architectural and Technical Drawing. These courses are popular with men in the industry who want to brush up on a phase of the industry and with young men just getting their start.

Manhattan College, in New York City, offers a Materials of Construction course as part of its School of Engineering curriculum, but the course is also open for non-credit part-time attendance. Specifications and testing are studied, along with properties and use of materials.

As part of its Civil Engineering Department curriculum, Columbia University offers a course in Construction Engineering. This survey course covers construction costs, procedures, problems, materials, and machinery.

Wide variety of courses

A special group of courses without credit is offered by the School of Technology of the City College of New York. Included are Structural Planning and Design, General Engineering, Engineering Economics, Blueprint Reading, Materials of Building Construction, Elementary Structural Design, Structural Steel Detailing, and Plan Reading and Estimating. These are evening courses open to the non-matriculated part-time student—whether a beginner or a veteran in the field.

In addition, the City College offers a course in Construction Planning and Job Management as part of its engineering curriculum. The material covered in this course is the kind that helps prepare young engineers for supervisory positions in the field.

At Newark College of Engineering in Newark, N. J., a course in Construction Engineering is offered for senior civil engineering students. An extension course in Construction Methods has been offered in the past and will be available again when the number of applicants warrants it.

Throughout the country, universities and colleges are offering practical courses in technology in connection with engineering programs, and a wide choice of technology courses in their extension or part-time departments. Too, two-year technological curriculums like that offered at the New York City Community College are to be found in technical schools over the nation.

The training programs are set up; it remains only for the schools and the construction industry to interest more young men in becoming trainees.

THE END

The Allis-Chalmers WD-45 Tractor and Henry Backhoe

Handyman around any construction job

45 belt hp — gasoline engine
Weight, 6,100 lb
10-ft 6-in. digging depth, 13-ft 10-in. reach with telescoping boom
8-ft digging depth, 12-ft 4-in. reach with standard boom
Loading height, 8 ft
Swing arc, 160 degrees

Mobility and Versatility keep the WD-45 with backhoe busy on a wide range of jobs — digging ditches, trenches, culverts, footings, foundations, and on backfilling. This unit is mobile enough to reach even the hard-to-get-at places — has the power and strength to help out on big operations — is small enough to work economically on the low-yardage jobs — get maintenance and clean-up work done fast.

Greater Working Range is now available with the Henry telescoping boom — digging depth of 10 ft 6 in. and reach of 13 ft 10 in. To widen the job range, there are seven interchangeable buckets, 12- to 24-in. width, front-end loader, and backfill blade attachments.

More Work Capacity because heavy-duty backhoe assembly is all-steel, box channel construction to take rough, hard use. All-hydraulic cylinders are powerful double-acting type with large-diameter piston rods. Replaceable bushings are on all wear points for longer life and less maintenance.

Long-Life Power. With big power output at low piston speed, the POWER-CRATER engine gives dependable, high-output performance on the tough jobs. Full-pressure lubrication, exhaust-valve rotators, removable exhaust valve seat inserts, and removable "wet" type cylinder liners contribute to long-life performance.

Operating Advantages help do a more efficient job in less time. Two-clutch control lets the operator make short moves while digging, with easy-to-reach hand control. Power-Shift rear wheels permit quick, easy shifting to wider wheel tread in soft footing or whenever more than normal tread is required for increased stability.

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

POWER-CRATER is an Allis-Chalmers trademark

ALLIS-CHALMERS

Device protects loaders from shock and vibration

■ How the shock-absorber action of the Greer hydraulic accumulator protects a bucket loader from shock and vibration is illustrated in a folder from Greer Hydraulics, Inc., New York International Airport, Jamaica 30, N. Y. This hydraulic component permits faster smoother bucket-loader operation, reduces structural strain in the vehicle, and lessens operator fatigue.

A schematic illustration shows the simple installation procedure by which the Greer accumulator is connected to the main pressure line with pipe-T and hose between the lift cylinders and control valve. Some manufacturers of bucket loaders are offering the Greer accumulator as standard or optional equipment.

To obtain Bulletin 1200 write to the company, or use the Request Card at page 18. Circle No. 449.

Washing and sizing plant

■ Construction and performance features of the large Pioneer 405-W scrubbing, washing, and sizing plant are described in a bulletin issued by Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.

The folder features a cut-away drawing illustrating the flow of materials through the plant, which can turn out up to five sizes and oversize of gravel and sand.

Advantages of this package-type washing plant, a description of all component units, and specifications also are contained in the bulletin.

To obtain Bulletin No. 648, write to the company, or use the Request Card at page 18. Circle No. 479.

The Schramm Rotadrill, designed for the 125-cfm Heavy Pneumatractor, provides a mobile self-powered rotary rock drill that can be used in generally inaccessible locations.

Rock drill designed for mobile air compressor

■ A portable drilling rig that is mounted on the 125-cfm Heavy Pneumatractor has been developed by Schramm, Inc., 900 E. Virginia Ave., West Chester, Pa. The Schramm Rotadrill on Pneumatractor, as the new rig has been designated, provides a mobile hydraulically-powered rotary rock drill with chip removal by compressed air. Requiring no auxiliary equipment, it offers a saving in initial cost.

The unit can drill a 4¼-inch hole to a depth of 500 feet. One-man operation is possible because all controls are arranged in one bank, adjacent to the mast.

Special weight boxes and dual rear-wheels on the Heavy Pneumatractor provide 10,000 pounds of down pressure. Normal compressed-air drilling pressures of 20 to 30 psi can be instantly increased for dewatering or breaking out blockages. A standard rotative head has a 75-rpm output and can be throttled down to complete stall while maintaining constant torque.

A heavy welded, structural-steel mast, lowered for traveling between jobs, can be operated at various angles for sloping holes.

For further information write to the company, or use the Request Card at page 18. Circle No. 480.

Bridge flooring material of corrugated steel

■ A new publication from Armco Drainage & Metal Products, Inc., Middletown, Ohio, deals with Armco bridge plank, a corrugated-steel flooring material for new or existing structures.

Design of the product consists of 2-inch-deep trapezoidal corrugations in 2-foot-wide steel planks. When welded to bridge stringers, the bridge plank is said to provide a firm base for a smooth bituminous surface.

The manual contains charts, tables, engineering details, and design data. A section describes recommended installation practice, and there is also a photographic record of actual bridge-plank installations.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 446.

Catalog gives details on two large tractor-shovels

■ The all-wheel-drive Michigan Model 175-A tractor-shovel with a 2½-cubic-yard capacity, and the smaller 1⅝-cubic-yard Model 125-A are described in a new catalog from construction machinery division, Clark Equipment Co., Benton Harbor, Mich. The booklet covers the operating advantages of the equipment in some detail.

It explains how a power-shift transmission reduces operator fatigue and speeds work cycles, why a torque converter cushions shock loads and increases digging power, and why planetary-wheel-drive axles mean elimination of axle-shaft breakage. Four cutaway drawings show the inside of the main components of the Michigan power train.

To obtain Catalog No. 1250-P write to the company, or use the Request Card at page 18. Circle No. 548.

Roof-deck insulation

■ A new brochure on its Fesco board roof insulation has been issued by F. E. Schundler Co., 504 Railroad St., Joliet, Ill.

The catalog details the composition of the board, its physical characteristics, and performance data such as K factor, weight, moisture resistance, and noncombustibility. It also outlines application specifications.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 503.

every inch

Engineered

for dependable service . . .

that's a Hendrix Dragline Bucket

A TYPE AND SIZE FOR EVERY DIGGING PURPOSE

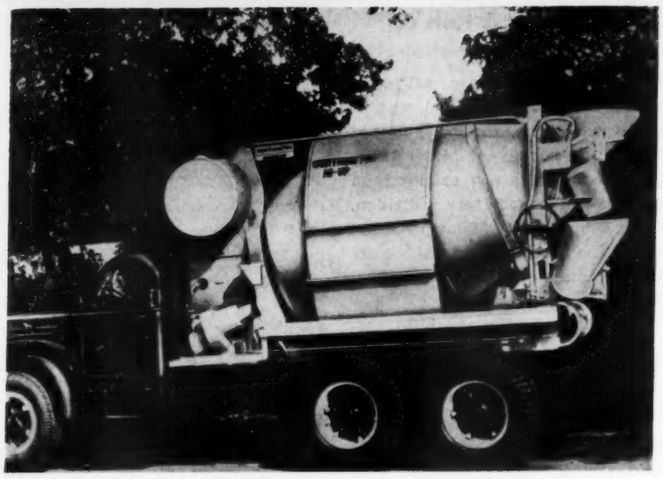
★ LESS BUCKET WEIGHT, type for type.
★ FULL PAYLOAD EVERY TRIP, even in wet digging.
★ ALL-WELDED CONSTRUCTION for greater strength and durability.
★ 14% MANGANESE STEEL chains, fittings and reversible tooth points.
★ PERFECT BALANCE: handle easier, fill faster, dump cleaner.
★ THREE TYPES: light, general-purpose and heavy-duty.

¼ to 40 Cubic Yards

Hendrix Lightweight DB Dragline Buckets

All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA



The new 7½ to 8-yard Hi-Up truck mixer introduced by Worthington Corp.

New 7½ to 8-yard truck mixer features simplified transmission

■ A new 7½ to 8-yard truck mixer has been announced by the concrete machinery division of Worthington Corp., Plainfield, N. J. The new Hi-Up mixer features a heavy-duty single-lever-operated transmission. Forward and reverse clutches and drum and brake gears are enclosed in a continuous oil bath.

A hinged distributing chute of new design extends approximately 8 feet when open and over 11 feet with an extension. A ratchet-type telescopic chute support simplifies adjustment of the chute.

The mixer is furnished with either two-compartment water-measuring tanks, or flush tanks calibrated to within 1 per cent accuracy. Water injection is accomplished by use of a "grout-out" double-seal water bell in the drum head, or by hopper water injection.

The mixing drum is of wear-resistant Manten steel with 3/16-inch-thick welded shell and 5/16-inch-thick drum with die-formed ribs. New die-formed blading is reported to provide proper mixing in a minimum of charging time, and rapid discharging on even the most difficult slumps.

With the addition of this new unit, the Worthington line includes mixers in 3 1/3 to 4, 4¼ to 5, 5½ to 6, 6½ to 7, and 7½ to 8-yard sizes.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 530.

Chute lining made of metal-backed rubber

■ A metal-backed rubber chute lining that can be used as a basic construction material installed on existing or new structures has been placed on the market by Goodyear Tire & Rubber Co., Industrial Products Division, Akron 16, Ohio.

Called "Armaplate," the new product consists of abrasive-resistant rubber bonded to hot-rolled steel. It can be formed, sawed, sheared, rolled, bent, and punched like sheet steel. The new chute lining can be bolted or tack welded.

The manufacturer emphasizes that the steel-bonded-to-rubber construction of Armaplate gives the material an advantage over other chute linings in that no foreign matter can become lodged between the metal and rubber bond.

Armaplate is being marketed in four sheet sizes: 48×180 inches, 48×144 inches, 36×180 inches, and 36×120 inches. The four sheet sizes will be available in four over-all gages: ¼, ½, ¾, and 1 inch, including the 1/16-inch steel plate.

For further information write to the company, or use the Request Card at page 18. Circle No. 492.

1 **Personalized Control Mountings** — New flexible cable control makes it easy to mount control lever bank in exact position most convenient for each operator. Flexible cable is threaded under tractor seat—completely protected from wear and damage. *All control cranks and links are totally enclosed for maximum protection.*

2 **Smoother Shifting, Longer Gear Life** with new Hyster Constant-Mesh Transmission. Gear design, with maximum tooth contact-ratio, assures positive action. All gears are case-hardened for longer life.

3 **Large Capacity Brakes** are designed to hold loads larger than can be moved by winch line. Cover plate can be quickly removed for easy external adjustment.

4 **Built In Drawbar** — can be quickly changed from rigid to swiveling action by removing two lock plates. Drawbar shaft is precision fitted in bronze graphite bushings.

Completely redesigned for use on the new Cat D7 and D8 Tractors, the new Hyster Model D8D (illustrated) add Model D7D winches will also be used on older model Cat D7 and D8 Tractors.

Hyster winches increase tractor pulling power up to 100% over straight drawbar pull—extend tractor reach to the end of the winch line. A Hyster winch can reduce costs on your job.

See your Caterpillar-Hyster Dealer or write direct to Hyster Company, 2952 N.E. Clackamas Street, Portland 8, Oregon, or 1852 N. Adams Street, Peoria 1, Illinois.

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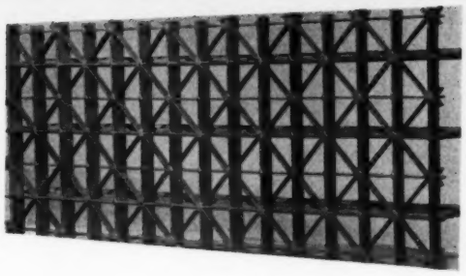

The new Greulich four-way-grid open steel bridge flooring uses deeper cross bars than usual, and, in addition, offers economies in installation.

New steel bridge flooring economical to install

■ An improved type of four-way-grid open-steel bridge flooring is to be manufactured by a new division of Kerrigan Iron Works, Inc., 1033 Herman St., Nashville, Tenn. The new division has been named after G. C. Greulich, engineer and designer of Pittsburgh, Pa., who has been retained as a consultant in the production of the flooring.

Mr. Greulich is the designer of the new bridge flooring, which is distinctive in that it allows the use of deeper, and thus much stronger, cross bars. This is made possible by a triangular top grid system, with grid beams spaced 7½ inches apart instead of the usual 6 inches.

A further advantage of this design is economy in field welding, as approximately 20 per cent fewer welds are necessary for attaching the grid to the main bridge stringers. The grids are manufactured in lengths up to 36 feet in 7-foot 3-inch standard widths, instead of the usual 4-foot 6-inch widths. This reduces the number of units to be handled in the field, and also makes a proportionate reduction in the number of lines of splices between adjacent grid units.

Mr. Greulich, who holds more than 100 other patents for various structural and fabricated metal devices, holds a Defense Department citation for his contributions to the war effort.

Besides the new steel bridge flooring the Kerrigan line includes stainless steel, aluminum, and riveted-steel gratings. The concern also makes a line of street and highway lighting standards, mast arms, and brackets.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 507.

Handbook on abney level

■ A new handbook offers concise but comprehensive instructions and illustrates methods for the use of the Leupold abney level.

This is a precision-built instrument used by surveyors, engineers, and contractors for topographic mapping; leveling; locating low standard roads; measuring heights of trees, poles, and clearances for overhead wires; and many other general surveying purposes. There are four types of graduated arcs available for the instrument: per cent, degree, topographic, and chainage corrections.

The new handbook includes a cutaway drawing of the instrument and a nomenclature listing of all parts. Written by Martin P. Coopey, professor of civil engineering, Oregon State College, the handbook is supplied with each Leupold abney level. Individual copies are available at 25 cents each from Leupold & Stevens Instruments, Inc., 4445 N. E. Glisan St., Portland 13, Oregon.

Drag scraper extends crane's reach and capacity

■ A field report issued by Sauerman Bros., Inc., Dept. C-34, 620 S. 28th Ave., Bellwood, Ill., tells how to extend the reach of a crane and, in many cases, double its capacity with a Crescent drag scraper.

A layout drawing and three pages of on-the-job photos illustrate the Sauerman method. When the scraper is equipped with a carrier and is used with a track cable, the machine's range is limited only by the spooling capacity of the hoist drums. The track cable extends from the crane's boom tip to an anchorage. In this way the Crescent scraper can reach far out, dig deep under water, and take material out of soft areas, without the use of mats and without the hazard of undermining the machine.

The report describes the advantages of scraper operation on certain jobs and offers an advisory service.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 445.

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With Simplex Ratchet Lowering Jacks minimum toe clearance is necessary. Loads are usually lifted from the ground to the toe of the jack by pinch bars or wedges. Only Simplex Jacks provide equal lift capacity on toe or cap. No other jacks offer such a combination of low cost and all-purpose utility. In fast jacking action—extra-safety features—and rugged strength for longer life, Simplex Ratchet Lowering Jacks give you more for your money! Available in capacities of 1½ to 35 tons. Write today for Bulletin: Industrial 49.

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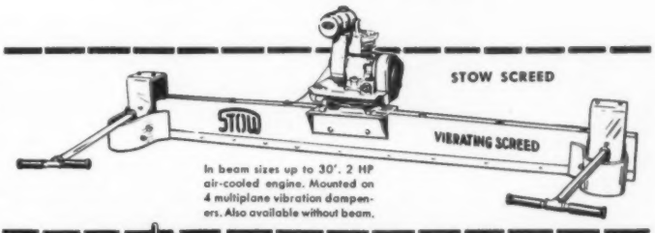
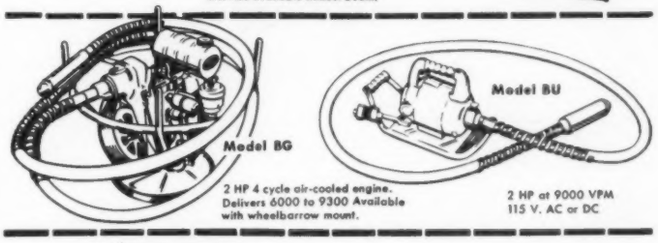
Concrete facts about Concrete Vibrators and Screeds

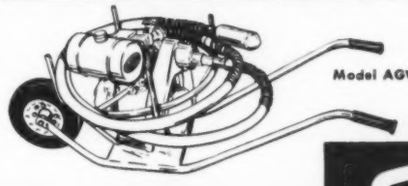


In beam sizes up to 30'. 2 HP air-cooled engine. Mounted on 4 multiplane vibration dampeners. Also available without beam.



2 HP 4 cycle air-cooled engine. Delivers 6000 to 9300 Available with wheelbarrow mount.

2 HP at 9000 VPM 115 V. AC or DC



4½ HP 4 cycle air-cooled engine. Mounted on wheelbarrow for easy maneuverability. Delivers 6000-9300. Available without wheelbarrow.

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The high operating speeds of the new STOW line of Concrete Vibrators make possible the use of heavy duty, light weight flexible shafting and lighter, more efficient vibrator heads—which speed operations, cut costs. And, STOW design provides convenient, practical speed control so *attachments may be used directly on the vibrator shafts.*

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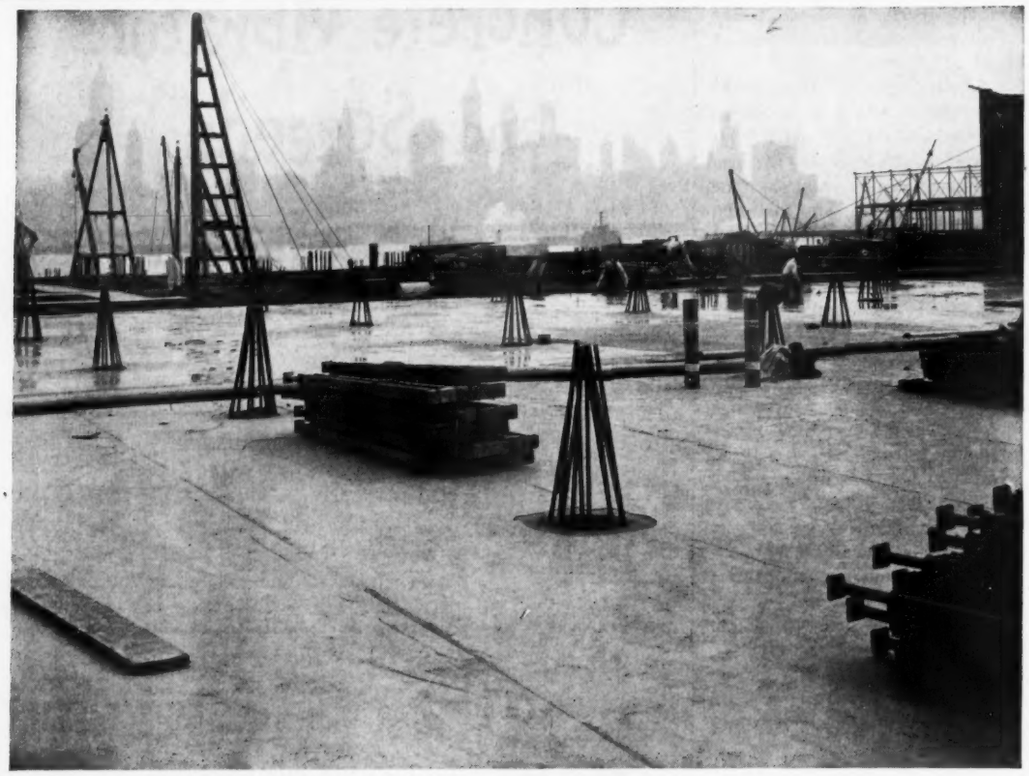
CONSTRUCTION CAMERA

Versatility is demanded of this International Drott TD-6 Skid-Shovel, which hauls a section of reinforced-concrete pipe for a new sewer line in Dallas, Texas. Since part of the line runs between houses where a big rig cannot work, the TD-6 is being used for installing pipe as well as for excavating and backfilling.

On a four-million-yard excavation job at Cherry Valley Dam, Calif., a Euclid end-dump is loaded by a Bucyrus-Erie 150-B shovel. This work on the hydroelectric and flood-control project is being done by Guy F. Atkinson Co., South San Francisco, Calif., for the Public Utilities Commission of San Francisco.



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GM "Powerama" to open this month at Chicago

A giant outdoor exposition portraying the contributions of diesel and aircraft power to America's industrial economy will be staged by General Motors Corp., Detroit, Mich., beginning the end of this month on Chicago's lakefront.

The "General Motors Powerama", to be presented August 31 through September 25, will feature demonstrations of virtually every type of diesel-powered unit. The exposition will also include stage shows, and will be open to the public without charge.

On a one-million-square-foot site on South Lake Shore Drive, scene of the 1933–34 Century of Progress, General Motors will display and operate a number of big power units used in transportation, industry, and heavy construction. Nine GM divisions—including Allison, Detroit Diesel, Euclid, and GMC Truck & Coach—will be represented at the exposition.

In the heavy-construction equipment display, earthmoving equipment—tractors, bulldozers, scrapers, compactors, and dump trucks—will go through its paces in demonstrations of actual field operations. A full-scale exhibit showing all the steps used in building a road is planned.

Cutaway models of heavy equipment will be displayed as part of the exposition.

Reportedly the largest exposition ever held by a single manufacturer, the "Powerama" will mark the production during this year of General Motors Corp.'s 100 millionth diesel horsepower.

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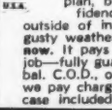

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STRATEX INSTRUMENT COMPANY, INC.
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Handling 15,000 cubic yards of borrow in two shifts daily, a Manitowoc 4500 dragline rushes work on a 30-mile stretch of the new Indiana toll road. Equipped with an 87-foot steel boom and Hendrix bucket, the rig loads about 250 of the 30-yard Euclids on the job every 10-hour shift.

Stabilization of soft marshy ground so that it will bear the weight of paving equipment and heavy traffic is carried out on a New Jersey highway project by the sand-drain method. The drains are being driven along the right-of-way by McKiernan-Terry pile hammers handled by Manitowoc Speedcranes.

ASTM standards compiled in handy reference book

More than 250 ASTM specifications, methods of testing, and definitions of materials have been compiled for handy reference in a new volume, "ASTM Standards in Building Codes", published by the American Society for Testing Materials. The matter previously had been available only in the 10,000-page seven-part "Book of ASTM Standards".

The compilation is designed for use by architects, engineers, contractors, and building-code authorities. Standards included cover the full range of construction materials, including structural and reinforcing steel; steel, cast-iron, and copper pipe; building units; bituminous roofing; cement; gypsum; and ready-mix concrete.

The material compiled in this volume is included by reference in the major building codes of the United States and Canada.

Another new volume published by the American Society for Testing Materials, "Symposium on Methods of Testing Building Constructions", contains papers and discussions from the 57th annual meeting of the society in June of 1954 at Chicago. Subjects treated include transverse strength of masonry walls, fire tests, wood diaphragm tests, lateral tests on roof components, etc.

Both volumes are paper-bound, and may be ordered from the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. "ASTM Standards in Building Codes" is priced at $6 a copy; "Symposium on Methods of Testing Building Constructions", at $2.75 a copy.

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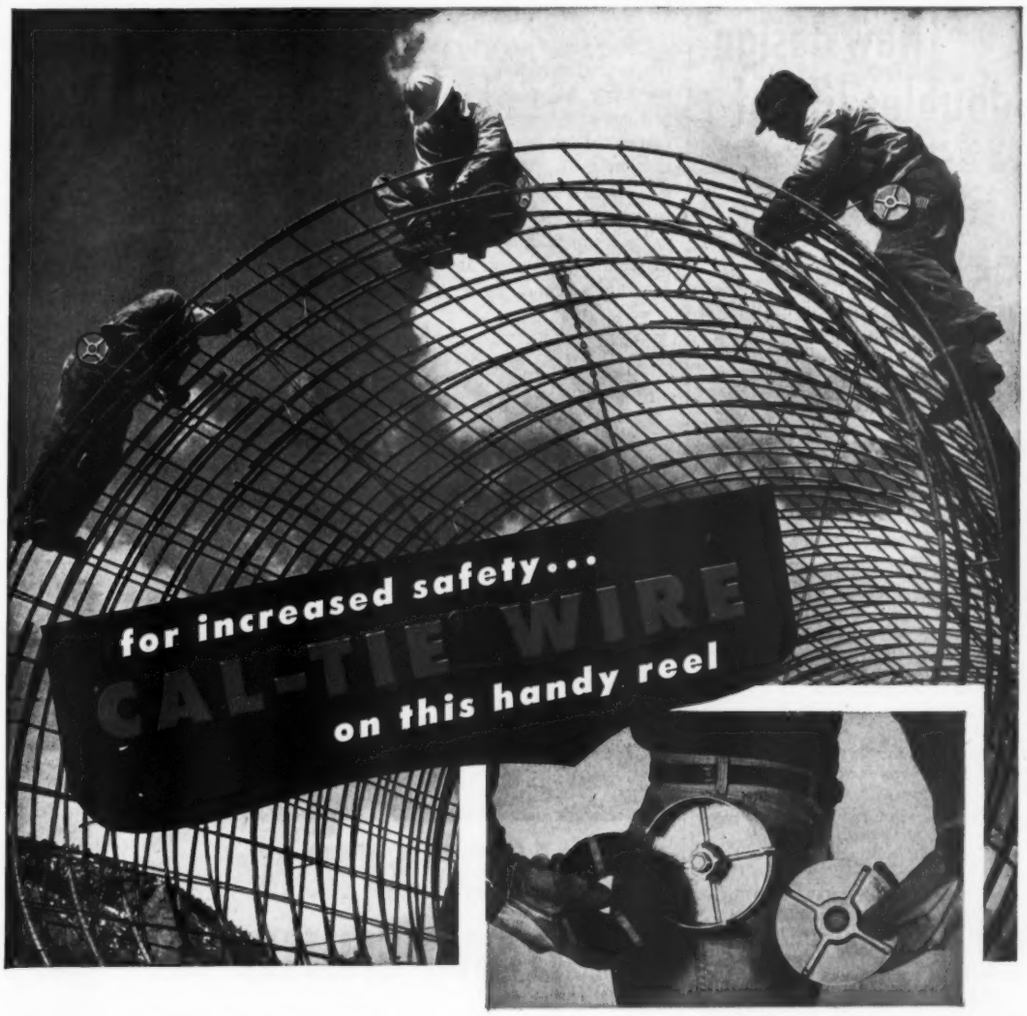

This modern way to carry re-bar tie wire is far safer than old-fashioned methods of carrying shoulder coils. There is nothing to catch on protruding objects, thus throwing workers off balance. There are no loose ends to trip workers . . . no resulting scratches leading to infections from clumsy shoulder coils.

By using Cal-Tie Wire you also save money . . . in two ways:

First, Cal-Tie Wire is handy . . . workers can cut the exact amount of wire needed for a tie. You reduce amount of wire wasted in excessive cut ends. Second, since workers do not have to remove reels to do other work, you eliminate the waste incurred when coils are put down and forgotten.

Cal-Tie Wire on reels also increases worker efficiency. Being compact, fast tying even in close quarters is possible . . . kinking and tangling are eliminated . . . no time is lost in preparing wire for tying. All in all, Cal-Tie Wire in the handy dispenser saves money, materials and manpower.

Cal-Tie Wire, made under the careful quality control of CF&I throughout every stage of its production, is available in gauges 14 through 20. Coils fit any standard tie wire dispenser. Try Cal-Tie Wire and this modern dispensing method on your next contract.

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Into the heart of Basutoland, South Africa, a Caterpillar D7 tractor, its bulldozer blade at an angle, clears blasted rock to make way for a modern road. About 59 miles of the route, which follows some existing bridle paths across the 10,000-foot-high Drakensberg mountains, has already been completed.

Road material for Canada's largest army base is turned out by a new Pioneer 150PRS crushing plant, which works with a Pioneer 46VE diesel electric bottom-deck-feed duplex plant. The plants are individually fed, but discharge to a common conveyor loading the bins to produce 5,000 tons of material in a 10-hour day.

New design doubles life of

crawler tracks

There are two reasons for the spectacular record of KENSINGTON crawler tracks wherever they have been tested . . . (1) improved design, and (2) superior wear-resisting alloyed manganese steel.

First . . . KENSINGTON engineers have designed a one-piece rail that ends the twisting and weaving which contributes to so much wear in ordinary tracks. Further rigidity and near-perfect alignment is gained by use of heat-treated alloy pins pressed tightly in place under high pressure. Grousers are heavied-up at all vulnerable parts to resist bending and breaking.

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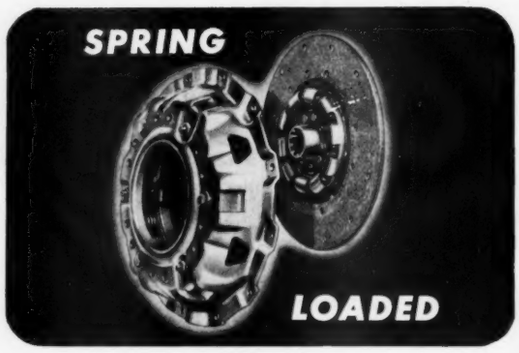
Firm wins approval for pipeline projects

The go-ahead signal for an $86 million project involving reconversion of the Little Big Inch pipeline system and construction of new pipeline facilities for the Texas Eastern Transmission Corp., Shreveport, La., has been given with approval of the project by the Federal Power Commission.

The project calls for reconversion of some 1,168 miles of the Little Big Inch line—extending from Beaumont, Texas, to a terminal on the Ohio River near Moundsville, W. Va.—from a gas delivery facility to a pipeline for petroleum products. Approximately $71,800,000 has been allocated by Texas Eastern for construction of a 382-mile pipeline and related facilities to maintain present gas pipeline capacity.

Reconversion work on the Little Big Inch line is already under way.

ROCKFORD



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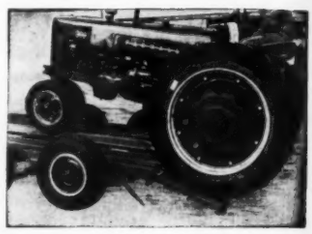

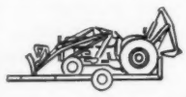

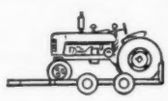

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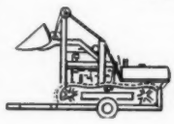

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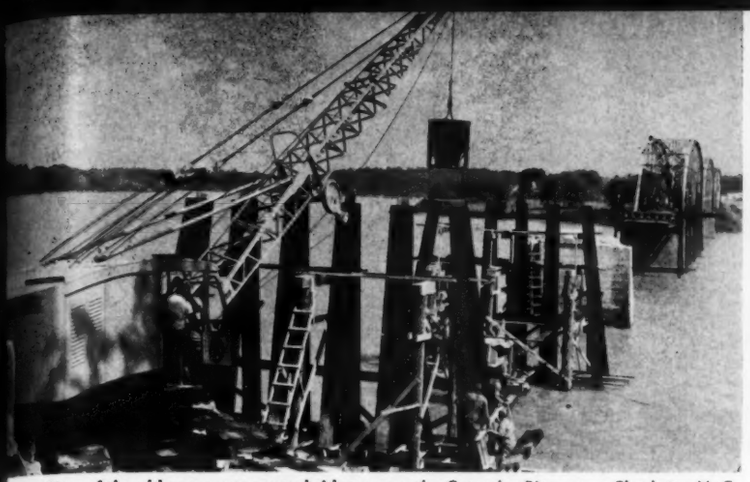
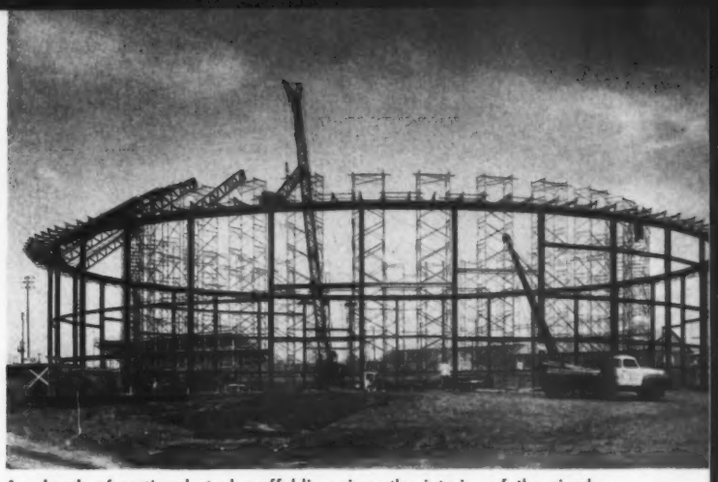


Piers of the old narrow one-way bridge across the Catawba River near Charlotte, N. C., are being recapped with concrete handled by a Koehring 304 crane, and braced with new steel piles which will be incorporated into the structure. F. A. Triplett, Inc., Chester, S. C., is doing the work on the new 1,059-foot span.



A cobweb of sectional steel scaffolding rings the interior of the circular gymnasium being built for Capitol City High School in Oklahoma City, Okla. The 32 towers, erected from 5-foot-wide Trouble Saver scaffolding frames, support 3,500-pound beams and provide a working platform for erectors.

Garden State Parkway map prepared in fourth edition

A new fourth edition of the Garden State Parkway map, showing the route of the New Jersey superhighway as it appears with the final major section opened, is currently available at toll plazas along the highway and will shortly be distributed to automobile clubs and touring services. Individual copies may also be obtained by sending a self-addressed stamped envelope to the Public Relations Office of the Garden State Parkway, 12 Broad St., Red Bank, N. J.

More than 1,250,000 maps of the parkway have been printed in three editions since the road went into extended operation in July, 1954. Though there have been changes in data, including an enlargement of a new connection with the New Jersey Turnpike, the third and fourth-edition maps are basically the same.

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Motoroller is versatile, too. Use it as auxiliary equipment to roll out laps left by large equipment and in confined areas of big jobs.

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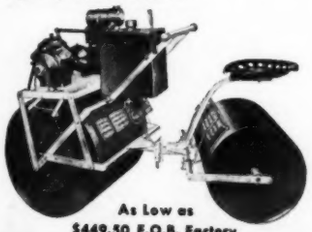

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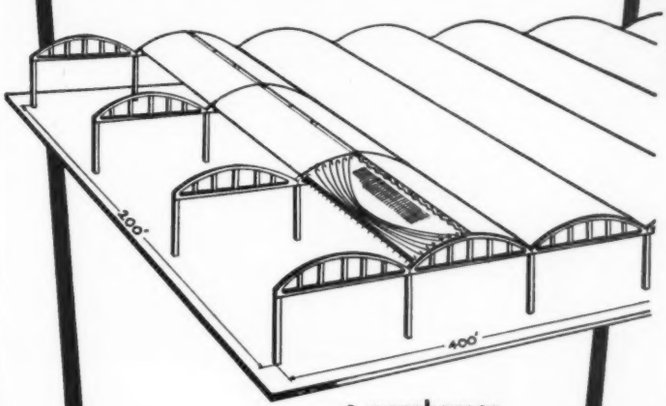

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Garden State Parkway

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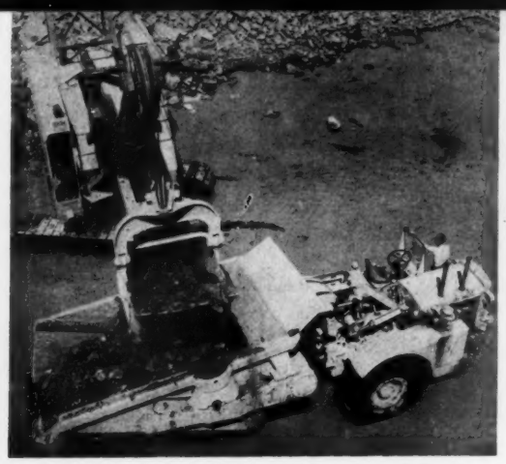
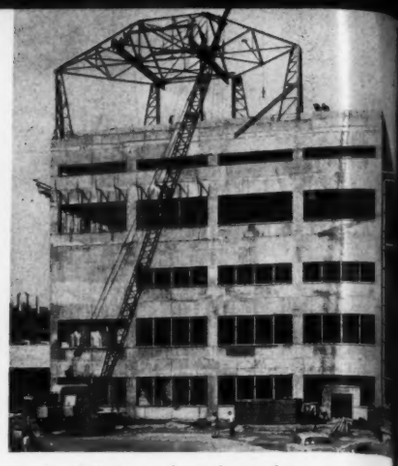
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

CONSTRUCTION CAMERA



The first load of rock moved on the St. Lawrence Seaway job is dumped by a P&H shovel into an Athey PR-21-Cat-DW21 haul unit near Montreal. The material is being used to build a dike on the river.

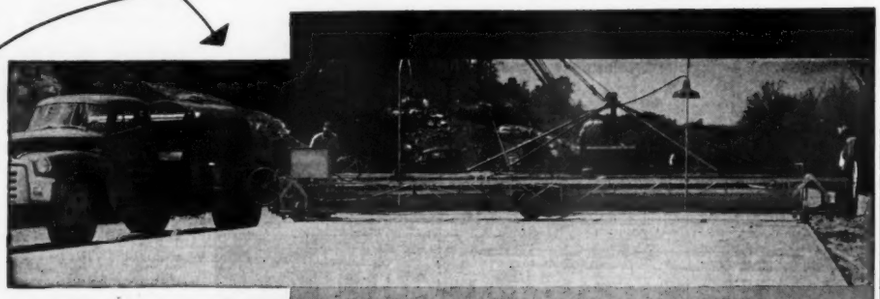
One-side alignment and bracing of about 13,000 square feet of Uni-Form panels, plus fast erection and stripping, saves time on concrete coagulation basins for the Louisville Water Co., Louisville, Ky.



Up to 100 tons of steel members are placed daily on a building at the Portsmouth, Va., U. S. Navy yard by a Lorain 30-ton Moto-Crane.

WORLD'S LARGEST CONCRETE ROAD CUTTING JOB PROVES SUPERIORITY OF *CARDINAL BLADES!*

1,000,000 feet of West Virginia turnpike cut in record time—at lowest cost in history!



In cooperative effort with William F. Middlestadt of Seals, Inc., of Baltimore, who furnished equipment and personnel, CARDINAL NON-BRAK BLADES cut a 68 mile x 1½ inch longitudinal joint in this new two lane highway, and a 24 foot transverse joint every 18 feet . . . total—1,000,000 lineal feet through limestone aggregate. Job completed with CARDINAL NON-BRAK BLADES in record time at a record low cost.

Cardinal NON-BRAK BLADES
Lowest initial cost on the market—reinforced with steel and fiberglas for better cut and longer life.

Cardinal DIAMOND BLADES
33⅓% more cutability than conventional blades—25% lower initial cost.

When you work with CARDINAL, you work with blade men who know the concrete cutting business . . . men who will frankly tell you when a rugged, low-cost CARDINAL NON-BRAK BLADE will do the job on green concrete, at less cost than a diamond blade . . . or, when a CARDINAL DIAMOND BLADE will give you the best deal, cost-wise, on aged concrete or other hard specifications. More footage per day . . . less cost per cut—that's the kind of guarantee that makes good sense. Call, write or wire, today!

Cardinal
ENGINEERING CORPORATION
World's Largest Exclusive Manufacturer of Concrete Cutting and Masonry Blades
144 BURNSIDE STREET, PHILADELPHIA 27, PA., U. S. A
Branches or Distributors in Most Principal Cities

TV will catch speeders on Massachusetts Turnpike

Special accident prevention patrols, special lights, fog fighters, snow-removal crews, a prohibition on the sale of alcoholic beverages in restaurants along the road—and television—are expected to give the Massachusetts Turnpike an enviable safety record when it opens November 15, 1956.

The tv cameras, which will be used to spot speeders and reckless drivers, are the latest additions to the safety apparatus planned for the road. One trooper at a tv observation post will keep certain sections of the road under scrutiny, contacting mobile patrol cars by two-way radio if he sees a motorist violating the speed limit. Since the turnpike has only 14 points of access and exodus, state police patrols will be able to exercise complete supervision over the entire road.

Ferry service may extend N. J. parkway route

A new highway route from New York to Florida came a step nearer realization when the Hudson River Day Line Inc., made its first progress report on the possibility of setting up ferry service across the Delaware Bay, to link New Jersey's Garden State

DUDGEON HYDRAULIC JACKS

SALES RENTALS

CAPACITY TO 600 TONS

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RICHARD DUDGEON INC. EST. 1850
789 BERGEN STREET BROOKLYN, N. Y.
• ST 9-4040 •

Caliche base material from a borrow pit is unloaded into a Hobbs Schonrock cable-dump trailer for a 70-mile haul to a paving job on U. S. 77 near Victoria, Texas. The job is being done by Haldenfels Bros., Corpus Christi, which employs a fleet of the units for the hauling job.

Pavement joints on an access road at Hector Field, Fargo, N. Dak., are sealed with Kapco filler from a trailer-mounted Clipper joint sealer. A LeRoi Tractair, which tows the rig, also cleans joints ahead of the sealing. The work is part of a runway-lengthening and improvement job at the airport.

Parkway with existing highway facilities leading southward.

Before a complete report is made to the parkway authority, October 15, the Hudson River Day Line will make a test run this fall between the Cape May terminus of the parkway and Lewes, Del. Such problems as the need for dredging to keep terminal facilities open constantly have already become apparent, but according to the initial report, the problems involved are not insurmountable.

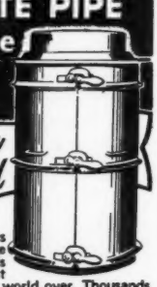
Should the service be approved, the Hudson line will be given a franchise to build and operate the ferry service. No highway funds are involved, since the parkway agency is barred from using toll income for such a project.

Equipment designer dies

Kenneth O. Duncan, 61, the designer and developer of the Duncan hydraulic Rok-Jak and a mining and construction man for 45 years, died June 5 in Los Angeles, Calif. Active most recently in the demolition field, Mr. Duncan held several patents on demolition and allied equipment. He is survived by his wife and two sons. The elder son, John, will continue to operate the Rok-Jak business.

For the FINEST CONCRETE PIPE You Need the FINEST FORMS!

THE "Quinn" Standard



Backed by over 40 years of reliable service, the QUINN STANDARD is recognized as the finest concrete pipe form the world over. Thousands of pipe manufacturers, from the smallest to the largest, look to Quinn for equipment to produce the finest concrete pipe at the lowest possible costs.

• QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry process. Sizes for pipe from 10" to 120" and larger. Tongue and groove or bell end pipe in any length desired. WRITE TODAY for complete information and estimates.

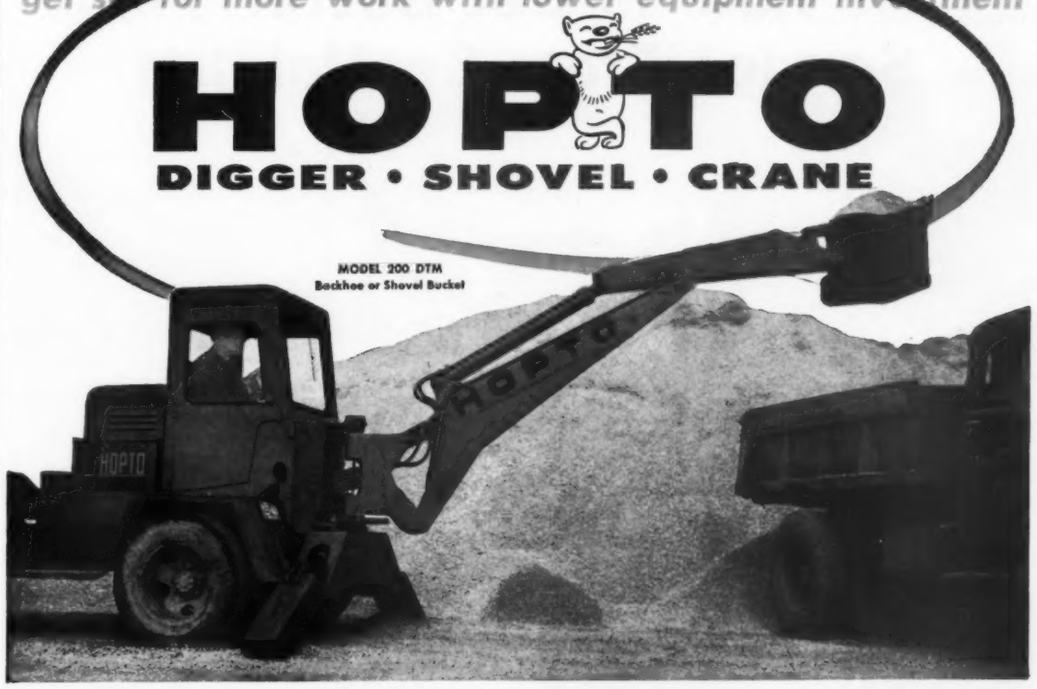
Also manufacturers of QUINN CONCRETE PIPE MACHINES

Quinn WIRE & IRON WORKS BOONE, IOWA

get set for more work with lower equipment investment

HOPTO

DIGGER • SHOVEL • CRANE



FAST CYCLING . . . HYDRAULICALLY OPERATED . . . EASILY MASTERED!

HOPTO Model 200 DTM illustrated above mounts on any 1½ ton or larger truck. This low-cost, big-capacity, versatile unit gives you a power shovel, crane and backhoe at *low equipment investment!*
HOPTO is completely hydraulic. Four levers give fatigue-free operation of this fast-cycling, 200° swing unit. The dipper stick extension mounting on the bucket gives 135° tilt. HOPTO digs 11½ feet below surface; lifts 13½ feet high with shovel bucket, more than 9 feet high with backhoe.
Alloyed steel hardened pins and self-aligning bearings at all pivot points, magnetically filtered oil, double wire braided hydraulic hoses and the elimination of all cables, sheaves and pulleys assure longer life, lower maintenance!

MODELS FOR EVERY NEED!

Badger manufactures a complete line of earth digging equipment from the large capacity, continuous Badger Trencher to the following models of the HOPTO Digger: Power take-off operated and self-powered trailer-type models, two models for mounting directly on any 1½ ton or larger truck, models for rear mounting on track-type of wheel-type tractors, a complete self-propelled track-type unit and the complete Model SPR unit shown below. All HOPTO units incorporate the completely hydraulic operation and the heavy-duty engineered features that make HOPTO the standard of comparison!
A wide variety of attaching equipment adapts HOPTO for any shovel or backhoe work. Half shell and skeleton type buckets and backhoes are available in a variety of widths for every application. Buckets are equipped with HL teeth.
Get all the facts and you'll get HOPTO!

BADGER MACHINE CO.

DEPT. E, WINONA, MINN.

WRITE FOR FREE FOLDER GIVING COMPLETE INFORMATION

A cambered boom for Bucyrus-Erie drag shovels has increased the digging force and reach of the excavators.

Cambered boom improves drag shovel's performance

■ A new cambered boom has increased the digging depth, radius, and force of Bucyrus-Erie Model 10-B, 15-B, and 22-B excavators. Designed for drag-shovel service, the boom is expected to be particularly useful in digging sewer trenches, basements, and pipelines or conduits, as well as for other utility and small contracting jobs.

Because the new boom is heavier than the one it replaces, the drag shovels will now have a more powerful digging stroke. Furthermore, cambering of the boom allows extra room for digging over corners of the crawlers. This is also a safety feature, since the drag shovel can now be positioned further from the edge of embankment.

The dipper has also been redesigned. It now has more heel clearance, and its sides are set at a greater slope for cleaner dumping. A longer lip with a longer shelf for heaping higher loads, and side cutters with straight cutting edges that offer less resistance to penetration are among other innovations. In addition, the dipper can be raised higher and brought in closer without spillage.

A deflecting sheave on the under side of boom prevents the dipper from going into toggle.

For further information write to Bucyrus-Erie Co., South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 518.

Compound-melting furnace is gas-fired model

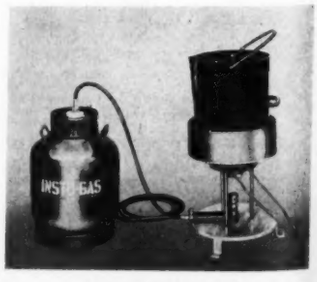
■ A new compound-melting furnace with its own tank of heating gas has been placed on the market by Insto-Gas Corp., 1977 E. Woodbridge, Detroit 7, Mich. Used with the 14-inch Instro-Gas No. 699 guard and a 5-gallon compound pot, the new No. 1230 furnace offers the contractor a lightweight instant-lighting compound heater.

The maufacturer points out that the gas-fired furnace offers several advantages over wood or oil-fired compound heaters. For example, if a pitch kettle boils over on a wood or oil furnace, the resulting fire is usually very hard to control. On the Insto-Gas model, however, the furnace flame can be shut off immediately by simply closing the valve on the gas cylinder. This is located within several feet of the furnace.

Furthermore, because a gas-flame can be controlled closely, there is less danger that the compound will boil over.

Recommended uses for this new Insto-Gas compound furnace include melting asphalt or pitch for roofs; melting tar for sealing seams in concrete; melting compounds for treating block floors; melting compounds for setting machinery; or melting jointing compounds for pipe.

For further information write to the company, or use the Request Card at page 18. Circle No. 505.

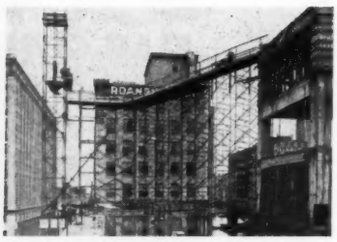


The new Insto-Gas Model No. 1230 compound-melting furnace.

How To Get Better Service From Scaffolding

To move material from the 12 story hoisting tower to a penthouse being built 100′ away, a Minneapolis contractor used Waco scaffolding to build a connecting catwalk.

As floors were added to the penthouse, another tier of scaffolding was erected so concrete and other material could be unloaded directly at the working level.

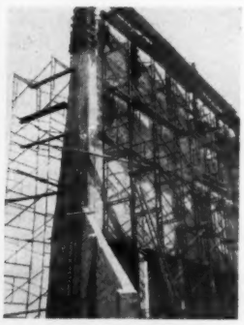


After the third and final story was reached, only 98 Waco scaffold frames had been used and the contractor had eliminated an auxiliary three story hoist and the extra manpower to operate it.

Contractors who know the many different ways that Waco Scaffolding can be used, find that they can not only reduce in-the-wall costs, but also meet tight construction schedules more easily.

Point the building and don't block traffic was the problem. The local Waco man licked it for an Akron contractor by running 22′ putlogs across the alley and tying them in at each end. He then erected his scaffolding on top of the putlogs.

Way down in Bogata, Columbia, South American contractors use Waco scaffolding to solve the problem of getting masons and bricklayers to the proper working levels fast and safely.



Spector & Son, Miami contracting firm, used approximately 90 Waco 6′6″ walk through frames to give maximum working area and ease of materials handling on this drive in theatre screen.

For instance, the runway that grew up with the addition to the Baker Building, Minneapolis, illustrated at top. It would have taken either a lot more laborers or a lot more time to move materials to the walls by any other method.

Or the scaffolding at left center that spanned the alley in Akron, Ohio, to enable a crew to tuckpoint the building without blocking traffic.

At the bottom left is the job in Bogata, Columbia where Waco's ease speed of erection beat high costs despite the shortage of experienced labor.

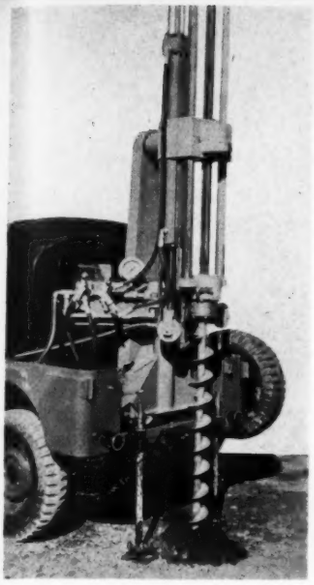
Walk through frames provided maximum working area for masons and helpers at a drive-in theater in Florida as illustrated at bottom right.

These are only a few of the hundreds of uses of standard Waco scaffolding for tough or average jobs.

You get better service when you use Waco scaffolding because Waco gives you a wider variety of standard frames. In addition, you get more job-engineered accessories; plus the exclusive "Speed-lock" method of attaching braces to frames; the built-in floating coupling pin for safer erection at higher levels; built-in ladders for convenience and pivoted cross braces for better load distribution.

Whether you own your scaffolding or rent it, your Waco scaffolding representative can help you make important savings in time and money. For more ideas on how to get better service from scaffolding, contact your Waco scaffold representative through the yellow pages of your phone book, or write to:

WACO MANUFACTURING COMPANY
3564 Wooddale Ave., Minneapolis 16, Minn.
Licensees:
Waco May Co. Los Angeles
Armson Iron Works Windsor, Canada



The Toledo earth drill bores into the ground from a jeep. The lightweight rig can be mounted on either two or four-wheel-drive vehicles.

Light, mobile drill rig

■ Information on soil structures and rock formations in almost any terrain can be obtained with the Toledo earth drill, a rig mounted on either a two or four-wheel-drive vehicle. Developed by the Toledo Testing Laboratory, a concern specializing in subsurface exploration, the drill is expected to lower costs through its speed of operation, light weight, and mobility.

Operating from the power takeoff of the vehicle on which it is mounted, the unit is moved to drilling position by a hydraulic system. Two jacks at the rear of the vehicle stabilize both the vehicle and the drill during operation. The rig can be moved into the bed of the vehicle for road travel, or it can be removed from the vehicle entirely and transported to another job by other means.

Suitable bits permit the drill to penetrate earth to a depth of more than 100 feet, and rock to a depth of more than 300 feet. In drilling earth, the Toledo drill bores into the ground with continuous flights of augers. It can drill rock with rods inserted into the hollow rotating stem and with diamond or steel drill bits, using chilled steel shot as the drilling medium.

Either lightweight plastic or steel casing pipe can be dropped through overburden and seated on rock to carry water and sludge to the surface when the unit is being used to drill through earth and into rock.

Though designed for heavy performance, the drill is light in weight, permitting it to be moved over rough terrain, through soft and muddy ground, and into wooded areas.

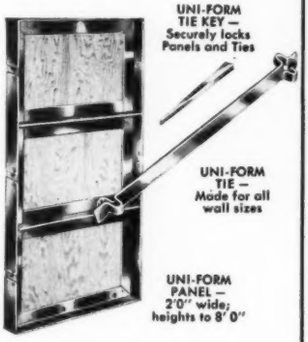
For further information write to Continental Equipment Sales, Inc., 1810 N. 12th St., Toledo, Ohio, or use the Request Card at page 18. Circle No. 490.

Supersonic flying will soon be restricted in Great Britain. Jets accidently crashing the sound barrier are making too much noise, London residents claim.

In building the $3,389,650 Pasadena Freeway Bridge as part of the State of California's highway system, Guy F. Atkinson Co., South San Francisco, Calif., used four Gar-Bro Power-Carts and a Gar-Bro concrete hopper to achieve a pour schedule of one cubic yard per minute. While one cart discharges into the form, others load from the double-gate hopper (upper right). The six-lane bridge is believed to be the largest concrete-arch bridge ever built.

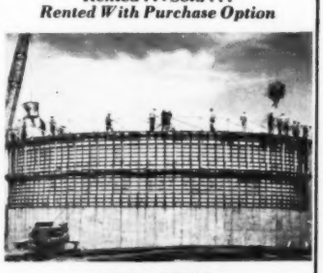
UNI-FORM
Concrete Forms

3 SIMPLE ELEMENTS FORM ANY CONCRETE STRUCTURE



UNI-FORM Concrete Forms are prefabricated steel-framed, plywood faced panels . . . ready to use when they reach the job.
UNI-FORM Ties and Keys lock and spread Panels into an automatically accurate form. No measuring — no guesswork. Completely versatile . . . they form straight, battered, circular, irregular or curved walls at lowest all around cost.

Rented . . . Sold . . .
Rented With Purchase Option



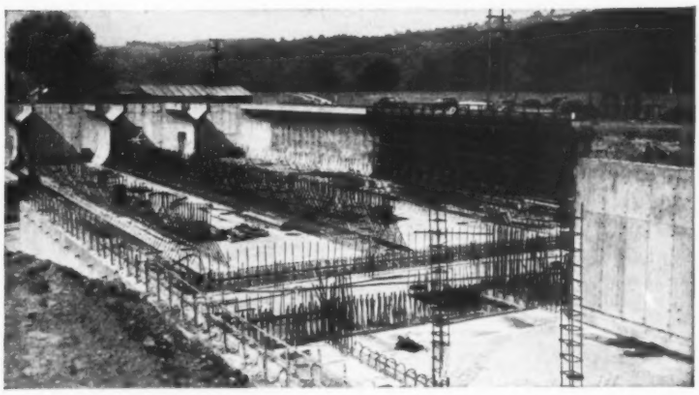
HIGH SPEED CIRCULAR WALL FORMING

UNI-FORMS provide faster, simpler and easier circular wall forming . . . one side alignment and bracing . . . absolute control of concrete, and safer, cleaner working areas.

Write for the UNI-FORM Catalog and complete details

UNIVERSAL FORM CLAMP CO.
1238 N Kostner Ave
Chicago 51, Illinois

Unique Prefab Form System Speeds Sewage Plant "Y" Wall Construction



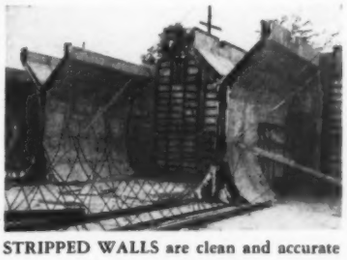
MECHANIZED FORMING with new "Y" wall trusses and UNI-FORM Panels speeds construction, saves labor and material

Field reports on a new system for forming "Y" walls in aeration tanks and settling basins indicate very satisfactory operation and important labor and material saving advantages for the system.

Developed by the Universal Form Clamp Co., Chicago, the new system is said to completely eliminate the many problems and difficulties encountered by contractors in forming this special type of wall in sewage disposal plant construction.

Specially designed trusses, which can be made to handle any type, height, shape or wall thickness, are used in conjunction with standard UNI-FORM Concrete Forms to form the "Y" wall. Assembly of the truss and UNI-FORM Panels into a complete form, ready to receive concrete is a fast, mechanical operation. Positive internal spreading and accurate wall thicknesses are assured by the use of Universal Spiroloc Cone Nut Assemblies.

Features incorporated in the design and operation of the Universal "Y" wall forming system eliminate the necessity of additional lumber or tying devices for the alignment and bracing of the unit.

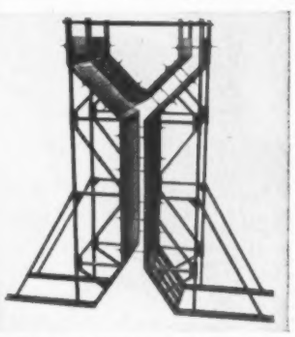


STRIPPED WALLS are clean and accurate

Erection, stripping and movement of the form can be handled either as individual pieces or as a large unit. Both methods have been very successfully used on recent projects.

Because standard UNI-FORM panels are used to form a large percentage of the "Y" wall contact area, it is possible to strip all UNI-FORM panels within a very short time after the actual pouring of concrete, leaving the trusses in place to provide the necessary support for the required period of time.

In this way, faster forming cycles, using minimum UNI-FORM equipment are possible, resulting in lower labor and material costs. UNI-FORM Panels are rented or sold, or rented with an option to purchase.

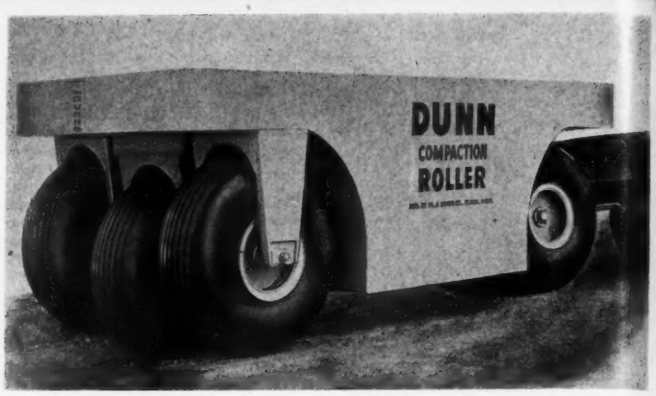


ASSEMBLED SECTION of "Y" wall truss with UNI-FORM Panels

For complete details on Universal "Y" wall forms and UNI-FORM Panels, Write:

UNIVERSAL FORM CLAMP CO.
1238 North Kostner Avenue
Chicago 51, Illinois
Distributors and Branches in Principal Cities

The Transo loader will be manufactured hereafter by Napco Industries, Inc., which has purchased the Transo Loader Division of Westinghouse Air Brake Co. Three models are now available, with bucket capacities of 12 cubic feet and 1 and 1½ cubic yards. For details circle No. 513 on card at page 18, or write to Napco Industries, Inc., 834 N. 7th St., Minneapolis, Minn.



A center compartment hinged at the front is the feature of the Dunn compaction roller. Through this design, the center wheel follows the road contour, with all wheels exerting equal pressure. The model shown has a compaction width of 74 inches and weighs 30,000 pounds ballasted. For details circle No. 514 on card at page 18, or write to M. J. Dunn Co., 2340 Hampden Ave., St. Paul, Minn.

Broadens grader working capacity

Now you can get Allison Torqmatic Converters in the fast-running, smoother-operating Austin-Western Super 88 Power Grader.

When you do you'll get a grader that's easier to operate because its Torqmatic Converter cuts the number of shifts needed to complete a pass or make a cut—allows the operator to concentrate on his bladework.

You'll get a grader that costs less to operate because the Torqmatic Converter automatically keeps the engine running in its most efficient power range—broadens the engine's working ability by increasing engine torque 2½ times—holds power to the load at all times.

And you'll get a grader that costs less to maintain, too. The Torqmatic Converter provides a shock-absorbing hydraulic cushion that protects grader components from shock damage—boosts engine life by preventing engine lugging and stalling.

Allison's 200-300 Series Torqmatic Converters in the Austin-Western Graders carry their own oil supply—have a simple dip stick to check oil level. They're the first converter packages in the 40-150 horsepower range on the market with an integral oil cooler, sump and charging pump.

You can get Allison Torqmatic Converters in a wide range of models for both gasoline or Diesel engines from 40 to 400 horsepower – Torqmatic Transmissions for applications up to 300 horsepower. Ask your equipment manufacturer or dealer about Allison Torqmatic Drives next time you buy or write for more information to Allison Division of General Motors, Box 894C, Indianapolis 6, Indiana.

GM TORQMATIC

Allison
TORQMATIC DRIVES

New brace lock increases scaffold's load capacity

■ A built-in gusset support, consisting of a brace-to-panel lock plate which increases load capacities of Adjustomatic scaffolding, is announced by Automatic Devices, Inc., 6107 Bartmer Ave., St. Louis 14, Mo.

The lock-plate provides a greater structural bearing on the horizontal members of the panel, permitting loads to be placed either on the legs or on the horizontals of the scaffold. Ultimate shoring capacities at points near the scaffold legs are now said to approximate the higher leg loads.

The resulting increase in scaffold strength and rigidity permits ledger lumber to be placed almost anywhere on the scaffold panel, according to the manufacturer.

The Adjustomatic standard scaffold has a tapered reinforced-aluminum coupler so that panels can be stacked swiftly and safely, and to prevent mortar and debris from clogging panel legs.

For further information write to the company, or use the Request Card at page 18. Circle No. 488.

Core-drilling machines

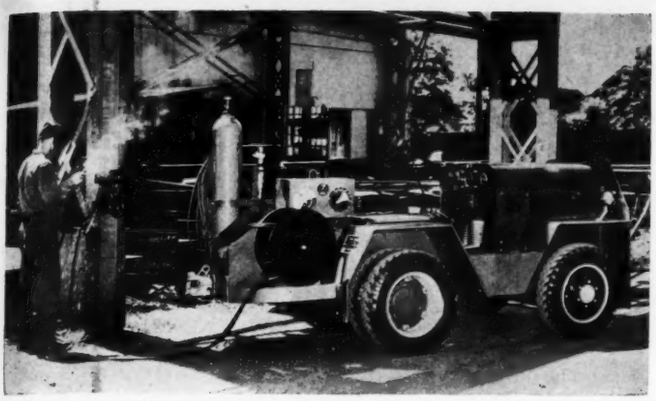
■ New lightweight core-drilling machines are shown in literature from Sprague & Henwood, Inc., Scranton 2, Pa. Two new diamond core-drilling machines illustrated, Models 30 and L-2, are compact units which can be moved easily from one location to another and can also be relied upon to produce good cores rapidly to moderate depths.

Both models can be powered by

Slope Meters Mean *Efficiency Plus* on Your Tractors, Dozers & Graders

Slope Meter installed on your earthmoving equipment increases working efficiency by telling the operator, automatically, the exact crown or slope on which he is working. Slope Meters cut construction costs on highways, airports, dams, and building sites.

Order from your Equipment Distributor today or from
THE SLOPE METER CO. EXCELSIOR, MINN.



Designed as a mobile self-powered welding unit able to handle jobs at scattered locations efficiently, the Unitow tractor arrives on the job ready to weld. Both the tractor and the 300 or 400-amp Lincoln generator are powered by an International Harvester Silver Diamond engine. For details circle No. 509 on card at page 18, or write to United Boiler & Foundry Co., Hammond, Ind.

Official Test No. 529 by the University of Nebraska's Agricultural Engineering Department at Lincoln, Nebr., has rated the International TD-24 at 161 drawbar horsepower. The standard-transmission TD-24 features 8 forward and 8 reverse speeds ranging from 1.6 to 8 mph. For details circle No. 512 on card at page 18, or write to International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

either a diesel or a gasoline engine, air motor, or electric motor. Normally skid-mounted, they are also available with an improved type of trailer mounting. A third option provides a complete self-contained core-drilling rig mounted on a four-wheel-drive truck.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 452.

Traveling mixer and paver

■ The Moto-Paver, a traveling bituminous mixer and paver is described in a booklet available from Hetherington & Berner, Inc., 701-745 Kentucky Ave., Indianapolis 7, Ind. This self-contained, self-propelled machine accomplishes the complete mixing and laying job in one continuous operation. A single-aggregate machine, the Moto-Paver uses sand, gravel, stone or slag aggregates, and most types of emulsions, cut backs, road oils, and tars.

The literature illustrates two models: a standard model for use under ordinary terrain and job conditions, and a heavy-duty unit for high production under difficult operating conditions. Specifications are listed for both types.

Also shown are H&B equipment designed for use with the Moto-Paver. This includes a portable dryer and the Moto-Loader, a unit that picks up windrowed aggregate and feeds it to the Moto-Paver.

To obtain Bulletin MP-55 write to the company, or use the Request Card that is bound at page 18 of this issue. Circle No. 522.

KIESLER
Since 1892
2-LEVER ARM
CLAM SHELL BUCKETS
with
POWER
ON BOTH SHELLS
"A PAYLOAD EVERY TRIP"
The ONLY Bucket that DIGS-IN instead of Lifting-Out.
Write for literature
JOS. F. KIESLER COMPANY
934 W. HURON ST. CHICAGO 22, ILL.

COSTS LESS

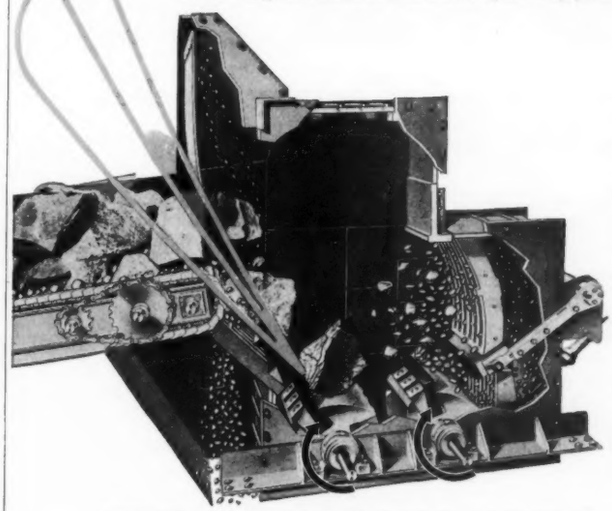
High ratio of reduction. One machine does combined primary and secondary reduction job . . lower initial cost.

BREAKS CLEANER, FASTER

Two hammer rotors turn in the same direction . . . . eliminate congesting of breaker, promote faster feeding, faster discharge, increased capacity.

UNIVERSAL IMPACT MASTER

Featuring Universal's exclusive operating principle: Controlled Impact Action.



It's no wonder Universal's Impact Master is the most efficient breaker you can buy. It can eliminate secondary crushers, take shovel-loaded run-of-quarry rock and reduce it to finished size in three seconds.

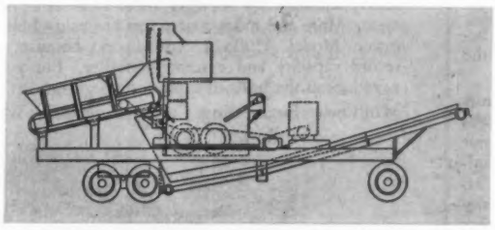
Here is why the Impact Master breaks rock faster and more economically. Both rotors turn in the same direction, assuring straight line flow of broken material away from hammers. Radial feed and absence of congestion provide unrestricted penetration of rock into the hammer circle for perfect impact. Hammers are always clean, always ready to break incoming rock most efficiently.

This saves you money because fewer hammer blows are required to do the job . . . less wear throughout machine . . . less horsepower.

Result: increased capacity of clean, cubical aggregate. What's more, finished product size is controlled easily with simple mechanical adjustments.

Universal's Impact Master provides capacities up to 1000 tons per hour. Get complete profit-making facts now. Write for literature.

Available in portable or stationary set-ups.



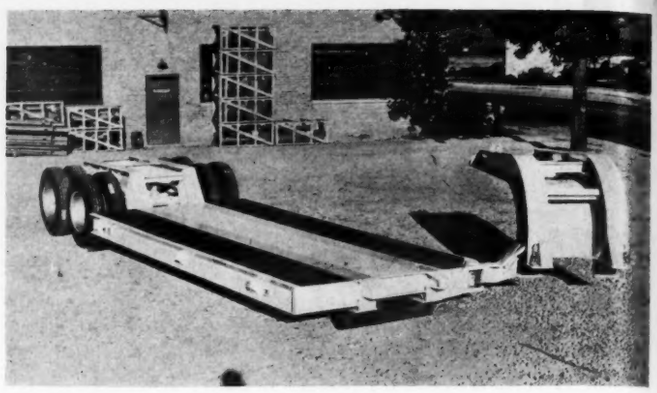
Portable Impact Master with apron feeder, folding discharge conveyor, three-speed transmission, and power.

The method of impact breaking which permits control of feeding, breaking and product size.

UNIVERSAL ENGINEERING CORPORATION
620 C Avenue N.W., Cedar Rapids, Iowa
A Subsidiary of Pettibone Mulliken Corporation,
4700 W. Division St., Chicago 51, Illinois

PETTIBONE UNIVERSAL
IN CEDAR RAPIDS SINCE 1906

The Bros SP-54 self-propelled pneumatic-tire roller with torque-converter all-rear-wheel drive and fast shuttle-gear transmission is shown compacting asphalt paving on Minneapolis streets. The Bros unit produces a smooth and less porous surface. For details circle No. 508 on card at page 18, or write to William Bros Boiler & Mfg. Co., 1057 10th Ave., S. E., Minneapolis 14, Minn.



The Swing-Away gooseneck on this 25-ton Sabre trailer does away with the use of a winch. The low-bed unit has an 8 x 16-foot deck and rides on 9:00 x 20 12-ply tires on a Hendrickson tandem mounting. For details circle No. 511 on card at page 18, or write to Sabre Equipment Div., Sabre Metal Products, Inc., 8000 W. 47th St., Lyons, Ill.

How a 5½ yard shovel, spotted on narrow benches, digs and trims a 284′ deep highway cut

Manitowoc 4500 excavates 600 yards per hour for Bruns Coal Company of Zanesville, Ohio, on highway widening job at Steubenville, Ohio

The Manitowoc Model 4500 will move most of nine hundred thousand yards of material to be excavated during the widening and modernization of 1.823 miles of Ohio State Highway #7 . . . Jefferson County, Ohio. Bruns Coal Company is working their 5½ Yd. rig two 8-hour shifts per day, digging through alternate layers of slate rock, coal seams, slate clay, flint clay and boulders. Blasting ahead of the machine cannot be uniform because of the layered quality of the soil, yet the Manitowoc digs as much as 600 yards per hour.

Bruns uses six 15 Yd. Euclid hauling units moving spoil from the big cut. The narrow benches are so cramped that the shovel must swing out over the lip of the cut when loading. The Manitowoc has a ground bearing pressure of only 9.6 pounds per square inch . . . (less than most one-yard machines)—and is exceptionally compact for a big machine (tailswing radius 19′4″). These factors plus the elevated pilot house (operator's eye level—15′) warrant record yardages without interruption of highway traffic directly below.

Another Manitowoc feature, the tubular dipper stick, has proven its worth in this excavation where the dipper encounters boulder, coal, slate, and clay during one digging cycle. Twisting, uneven digging forces only dip the dipper slightly and transmit no strain to the boom or shipper shaft, yet lift of the hoist rope maintains an upright dipper position and digging shocks are absorbed without the damage which might necessitate excessive maintenance in any other rig.

Besides the drill rig and hauling units, the Manitowoc is the only other machine on this cut. *Controlled Power* . . . Single diesel engine with a torque converter power take-off gives ample flexible power and speed. 52″ drum brakes and 49″ clutches, are air operated for the smooth, precise control necessary to cut, trim and finish this 284′ deep 1-to-1 slope!

Modern highway construction hinges on the ability and capacity of larger, more efficient equipment. More and more contractors are using Manitowoc Model 4500's for roadwork because of record capacity and extreme mobility. Bid your next job on the basis of a Manitowoc.

Manitowoc Engineering Corp., Manitowoc, Wis.

. . . working in close quarters, Manitowoc hangs over the highway, where traffic continues without stop.

Hydraulic excavator shown in wagon-carrier model

■ A folder showing the Gradall excavator in a self-propelled wagon-carrier model has been issued by Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.

Maneuverability is a feature of the self-propelled wagon carrier mount, which has a tight turning radius. Also, a convenient control panel gives the operator power steering, power shifting, and power brakes for the carrier through an instantaneous air-electric remote control system.

Separate engines are provided for the carrier and upperstructure. A 6-cylinder 97-hp gasoline engine drives the carrier, and either gas or diesel power is available for the upperstructure. The wagon mount's engine enables it to climb 25 to 30 per cent grades or over rough ground.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 442.

● Matches Color of Concrete
● Fully Resilient . . . Non Extruding

Servicised Cementone Gray Sponge Rubber Expansion Joint meets the need for an inconspicuous joint filler for architectural concrete. Can be supplied in various degrees of compressibility to meet your requirements. Made in widths to 24″ and lengths to 10 ft.

Write for details and the complete Servicised Catalog today. There is no obligation. See SWEET'S Catalog.

SERVICISED PRODUCTS CORP.
6051 W. 65TH ST. • CHICAGO 38, ILL.

Drilling 4-inch-deep holes into concrete foundations that are under water except for four hours out of the day, the Atlas-Copco Model BBD-11 rock drill speeds work on remodeling job being done on San Francisco's 57-year-old landmark Ferry Building. For details circle No. 515 on card at page 18, or write to Copco Pacific, Ltd., 930 Britan Ave., San Carlos, Calif.

This Nelson B-68 bucket loader is handling well over 2,000 tons of material daily, ranging from sand to 2½-inch stone, for Samuel Braen Industries of Wyckoff, N. J. The B-68, largest Nelson bucket loader ever built, features four-wheel-drive and hydraulic crowd. For details circle No 510 on card at page 18, or write to N. P. Nelson Iron Works, Inc., 850 Bloomfield Ave., Clifton, N. J.

Jaw crusher features strong light frame

■ The Rock-Ram, newest in the Lippmann line of overhead eccentric jaw crushers is described in a booklet available on request.

Among new construction features found on the Rock-Ram is a multi-layer frame construction. Fabricated of three relatively thin layers of steel, the frame of the Rock-Ram has the advantage of the strength offered by 6 surfaces. This construction takes advantage of the strength derived from the surface tension of steel.

The literature has cutaway views of the equipment in which construction features are identified and illustrated. The Rock-Ram is available in sizes from 10 × 16 to 30 × 26, with discharge openings of 1 to 10 inches.

To obtain Bulletin No. 1111 write to Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 475.

SPRAY-LUBE . . . For Open Gears

Here's a superior heavy-duty grease for open gears on:

CRANES BACKHOES SHOVELS
ROLLERS RIGS WINCHES

SPRAY - LUBE encourages proper lubrication . . . and gives you these important benefits:

1. Easy to apply. No fuss. No mess
2. Pressure packed in an easy-to-carry aerosol dispenser
3. No waste—No throw off
4. No pre-heating
5. No more brushes or paddles

Packed in 12-can cases. For additional information about SPRAY-LUBE, write to:

PRESSURE PRODUCTS CO.
Box 342
West Chester, Pennsylvania
Selected dealerships available

"Easiest handling truck I ever drove," says H. E. Williams of his Ford T-800 BIG JOB. "Power Steering is a mighty big help. Couldn't get along without it." Power Steering is standard on the T-800. For power, the Short Stroke 170-h.p. *Cargo King* V-8. New, increased GVW of 42,000 lbs.

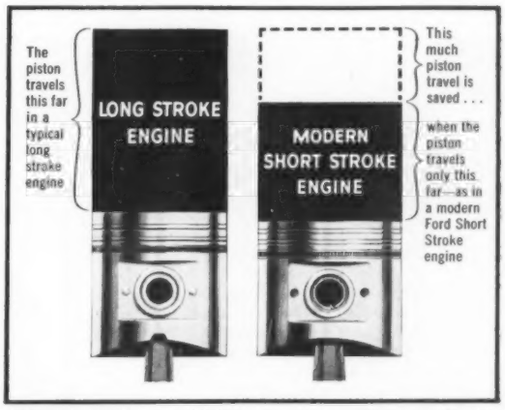
"Ford's Short Stroke engines take any amount of punishment"

"A truck engine has to take a real beating in my kind of work, but this Ford Short Stroke engine can take any amount of punishment and come back for more," says H. E. Williams, President, Little River Gravel Company, Temple, Texas. "We've been using Ford Trucks for 20 years. One reason is that Ford's got such a good reputation for long life that I can count on a higher price for my trucks come trade-in time."

The many advantages of a modern Short Stroke engine can be yours tomorrow, if you make your next truck a Ford. Only Ford puts Short Stroke design under the hood of *every* model, with a line of Short Stroke V-8's and a Short Stroke Six.

For up to 53% longer piston ring life, gas savings as great as 1 gallon in every 7, see your Ford Dealer right away!

FORD TRIPLE ECONOMY TRUCKS
THE MONEY MAKERS FOR '55


The piston travels this far in a typical long stroke engine
LONG STROKE ENGINE
MODERN SHORT STROKE ENGINE
This much piston travel is saved . . .
when the piston travels only this far—as in a modern Ford Short Stroke engine

Differences between outdated long-stroke engines and Ford's modern Short Stroke design are far *greater* than they seem. In one case, Ford's stroke is shorter by 1⅜ inches. But, in a year's driving of 11,000 miles this shorter stroke means *2,090 miles less piston travel per piston!* Think of the wear and friction you save right there!

Improved power shift speeds work cycle of new 2-cubic-yard tractor shovel

The Model HO, newest of the Payloader tractor shovels, features a new power-shift transmission through which shifts in all speed ranges can be made without stopping or slowing down the machine.

Using breakout pads against the ground as a fulcrum for leverage, new Hough Payloaders achieve a "pry-out" bucket action. In addition, the bucket can be made to tilt 40 degrees at ground level, so that the load can be carried low and close to the machine.

■ The newest Hough Payloader, a 2-cubic-yard model, features a power-shift transmission through which all shifts can be made without stopping or even slowing down the machine. This includes shifts through all speed ranges and in both forward and reverse.

Furthermore, like the 1 and 1½ cubic-yard models HU and HH Payloaders introduced earlier this year (see C&E June, 1955, p. 99) the new Model HO has "pry-out" bucket action, 40 degrees of "breakout" at ground level, as well as new safety and stability features.

The new power shift not only simplifies the job of operating the Model HO but also adds considerably to the work speed and, therefore, to the productive capacity of the machine. Operating under heavy loads, tractor shovels of this size generally require frequent shifts between working and travel speeds. Since all such shifting can be done while the Model HO is in full motion, the work cycle of the new unit is reported to be considerably faster than that of comparable models.

The "pry-out" bucket action of modern Payloaders is accomplished by using "breakout" pads on the ground as a fulcrum for leverage. During the "breakout" opposing load forces are transferred through the pads to the ground instead of to the axles, wheels, and hydraulic system.

Furthermore, having 40 degrees of bucket "breakout" at ground level, the machines retain larger heaped loads than would be possible otherwise. Payloaders travel with the loaded bucket at a ground-level carry position. The over-all length of the new Model HO with the bucket in this carry position is actually less than with the bucket in digging position. Together with a longer wheelbase, this ability to cradle the load close provides Payloaders with exceptional stability.

Among other advances are increased safety and visibility, which result from a combination of the underslung design of and the position of the boom-arms. The need for safety guards or screens to protect the driver from the boom-arms during raising and lowering operations has been eliminated.

Attention has been given to driver comfort with an adjustable seat having a molded foam-rubber seat and back cushions which have one-piece frame.

According to the manufacturer, the new HO Payloader has greater horsepower and more weight in relation to its 2-cubic-yard capacity than other standard makes. The lifting and dumping height of the HO is greater than average and this new model is available with either gasoline or diesel power.

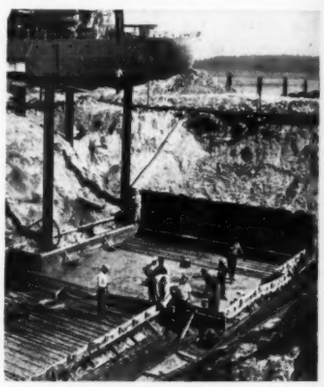
Other features include: a sealed, pressure-controlled hydraulic system; 12-volt battery system on the gas-powered model with battery box and hydraulic-oil reservoir mounted behind the driver's seat for easy accessibility; torque converter; and double-acting hydraulic rams with chrome-plated piston rods. Vacuum-boosted, 4-wheel hydraulic brakes and power steering are standard. A load-shock accumulator device is optional. Both head and rear driving lights as well as tail lights are standard and an exterior pick-off outlet for outside hydraulic circuit use with auxiliary equipment has been provided.

For further information about the Model HO Payloader write to Frank G. Hough Co., Libertyville, Ill., or use the Request Card that is bound in at page 18 of this issue. Circle No. 519.

HOW TO HANDLE WET JOBS

MUNICIPAL POWER PLANT STRUCTURE
Jacksonville, Fla.

Contractor: George D. Auchter Co.



WELLPOINTS LOWER WATER OVER 20 FT IN ONE LIFT

WHEN CONFRONTED with the problem of draining ground water to such a depth, most contractors assume that a costly 2-stage wellpoint system will be necessary. Today it is possible to avoid these costs, thanks to the development of improved new high-lift pumps (available only through Griffin).

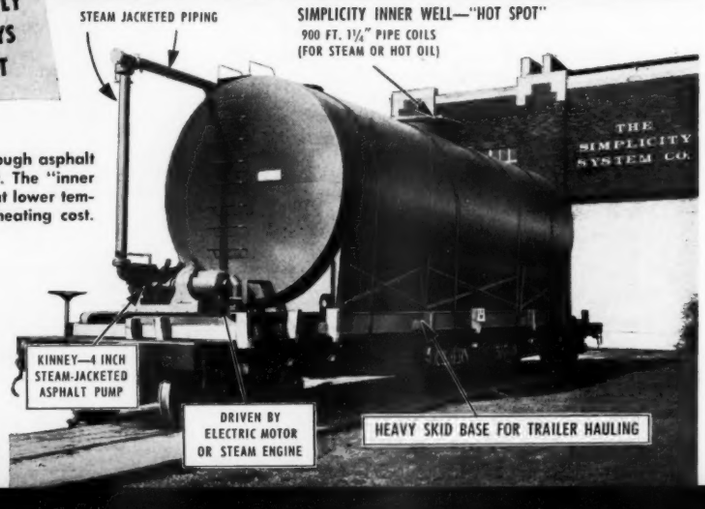
• On the above job, for example, one such high-lift electric pump lowered the ground water from elevation 101 to elevation 80.7 in a single lift. Photo shows the bone-dry excavation, with men working 20 ft below adjacent St. John's River.

• Another feature of this job was the engineers' expert planning and placement of points, giving contractor trouble-free results in difficult soil—fine sand with layers of muck and hardpan.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax
CONTRACTORS AND ENGINEERS

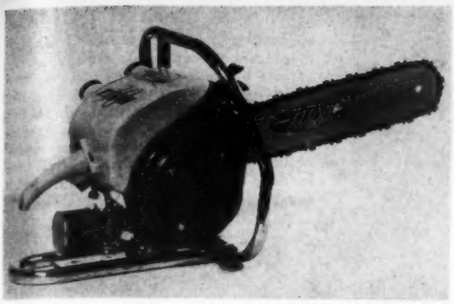
YOU CAN SAVE THE ENTIRE COST OF A SIMPLICITY ASPHALT STORAGE AND SUPPLY SYSTEM IF YOU SAVE EVEN A FEW DAYS DELAY ON A LARGE PAVING PROJECT

SIMPLICITY HORIZONTAL ASPHALT STORAGE TANK
18,500 GALLON CAPACITY


STEAM JACKETED PIPING
SIMPLICITY INNER WELL—"HOT SPOT"
900 FT. 1¼" PIPE COILS
(FOR STEAM OR HOT OIL)
THE SIMPLICITY SYSTEM CO.
KINNEY—4 INCH STEAM-JACKETED ASPHALT PUMP
DRIVEN BY ELECTRIC MOTOR OR STEAM ENGINE
HEAVY SKID BASE FOR TRAILER HAULING

SIMPLICITY TANKS (with "Hot Well") keep only enough asphalt heated to required temperature to supply the plant. The "inner well" is insulated by the larger quantity of asphalt at lower temperature in the "outer tank." This saves much in heating cost. For larger storage tanks, up to 400,000 gallons, Simplicity offers its Portable Vertical-Type Tank, also with the "Hot Well."

THE SIMPLICITY SYSTEM COMPANY
DIV. OF WEST CONSTR. CO.
RIVERSIDE DRIVE
CHATTANOOGA, TENNESSEE
PHONES: 2-2144, 2-2145, 2-7667



The Titan Model 30 chain saw.

Improved chain saw cuts at any angle

■ A new chain saw that features a direct drive providing a high chain speed has been announced by Titan Chain Saws Inc., 2700 Fourth Ave. S., Seattle 4, Wash. The Titan Model 30 saw is powered by a 3-hp 2-cycle gasoline engine, and has diaphragm-type carburetion for cutting in all directions. An automatic clutch makes it possible to control the saw with one hand.

Available with 14, 18, and 22-inch bars, the new saw weighs 27 pounds complete with a 14-inch bar and BlueJet chain. The power unit can be easily detached from the rest of the saw.

Other features are an alloy bar with specially hardened running edges and tip, built-in automatic oiler that oils only when the chain is running, and a fuel-tank capacity of 3⅝ pints.

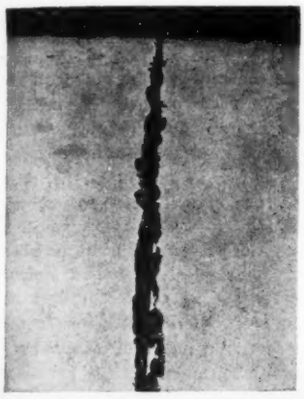
For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 549.

Complete roller line is shown in new catalog

■ The line of standard and variable-weight three-wheel rollers made by Huber-Warco Co., Marion, Ohio, is described in Bulletin HWR-511 issued by the company. Photographs of the 8, 10, 12, and 14-ton standard models, and the 8 to 10, 10 to 12, and 12 to 14-ton variable-weight rollers are supplemented by descriptions of the equipment.

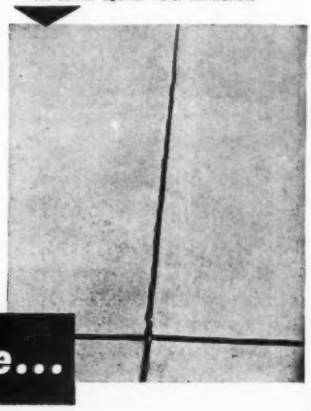
Features of the frame, transmission, gear train, final drive assembly, front end, operator's controls, ventilation system, and attachments are emphasized in diagrams, photographs, and cross-section drawings. A special section of the booklet describes the development of road machinery by the companies now making up the Huber-Warco organization.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 517.



Old joint filled with a hot poured type sealer. Note cracks which permit water penetration through joint.

Tightly bonded joint uniformly sealed with cold applied Presstite No. 77, forming impervious barrier against water infiltration.



See the difference...

when paving joints are sealed with *Cold Applied* PRESSTITE No. 77

To reduce paving maintenance costs, resulting from havoc wrought by repeated expansion and contraction of pavement, Presstite's Research Laboratory developed a *cold applied* paving joint sealer... Presstite No. 77.

Proven on more and more highway and airport paving jobs, Presstite No. 77 has conclusively demonstrated its superiority for sealing joints in new pavement and for maintenance re-sealing. It remains flexible, resilient and adhesive, withstands repeated expansion and contraction of the pavement, and forms an impervious barrier against passage of water through the joints and into the sub-grade below.

Quick, easy and economical to apply, Presstite No. 77 remains tough and elastic under extremes of temperature and heavy traffic.

Here is a proven paving joint sealer that provides longer lasting, more satisfactory pavement service, resulting in greater maintenance economy.

WRITE TODAY for new catalog and full details on *cold applied* paving joint sealers.

Re-sealing runway paving joints at Davenport, Iowa, Municipal Airport. Presstite No. 77 is quickly and easily pumped under pressure directly from drum into joints.

PRESSTITE SEALING COMPOUNDS

PRESSTITE ENGINEERING COMPANY

3788 Chouteau Avenue St. Louis 10, Missouri

THE NEW **UNIT** *Challenger* ... as a TRENCHOE

ALL-WELDED BOOM with Gooseneck Design for Deep Digging

FAST on the Job...EASY to Handle!

Added to the UNIT line of proven equipment, is the New UNIT CHALLENGER. Here's a modern ⅜-yard machine that provides a perfect combination of design and construction. Packed with new advanced engineering features: **Self-aligning Hook Shoes... Force Feed Lubrication... Full Floating Trunnion-Mounted Tapered Drums... Torque Converter,** etc., the New UNIT CHALLENGER is the most dependable machine that money can buy.

Bulletin C-800 completely describes and illustrates the New UNIT CHALLENGER.

Send for Bulletin Now

UNIT CRANE & SHOVEL CORP.

6309 W. Burnham St. • Milwaukee 14, Wis., U.S.A.

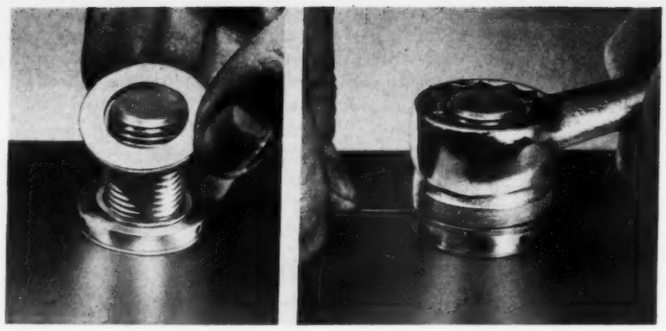
Geared to boost your earnings!

Washer device provides accurate preloading of structural-bolt fasteners

■ A unique method for the controlled tightening of structural-steel connections through the use of a small two-part washer is announced by Standard Pressed Steel Co., Jenkintown, Pa. The concern is marketing the PLI washer, which tightens structural bolts to predetermined preloads as high as 80 per cent of bolt yield strength. This high preload is almost twice as high as the average obtained with torque wrenches.

Since in dynamically-loaded structures the higher the initial preload, the greater the life and design strength of bolts in fatigue, the PLI washer will often permit the use of fewer or smaller bolts for a given load. In this connection, reported fatigue tests indicate that bolts preloaded with PLI washers last up to fifty times as long under dynamic load without failing than similar bolts tightened to the minimum preload to be expected from torquing.

The PLI washer was first developed by Douglas Aircraft Co., Inc. for its own use. Under sole license from Douglas, Standard Pressed Steel Co. is now producing a complete line of cadmium-plated PLI washers from heat-treated alloy steel for standard bolt sizes ranging from No. 10 to 1½-inch diameter. Smaller sizes will be added in the near future. The washers are available for a wide variety of bolt types ranging in ultimate tensile strengths from 80,000 to 240,000 psi.



At far left, 2-part PLI washer is shown in place between two auxiliary washers. As the nut is tightened (right-hand photo), the higher center portion of the PLI washer is compressed, until the outer or shallower ring binds. At this point, detected by means of a feeler handle of thin wire, the desired preloading of the structural bolt has been reached.

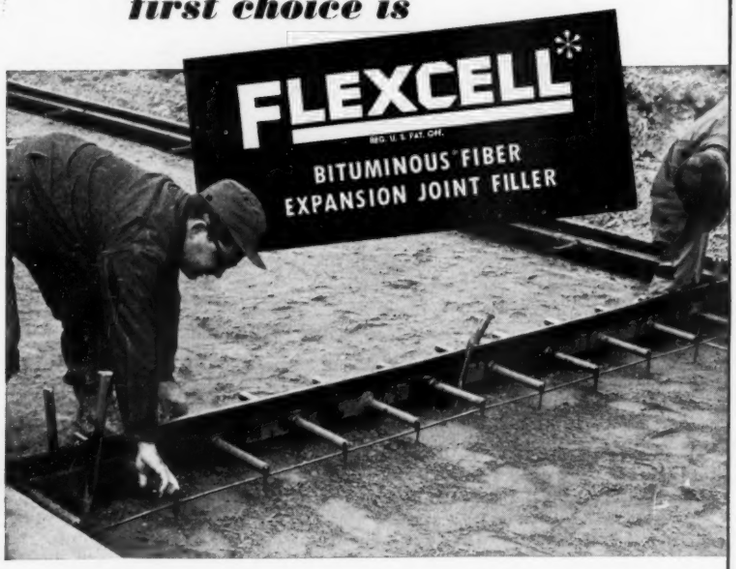
The PLI washer consists of two concentric steel rings, one fitting freely inside the other, with the inner ring greater in height than the outer ring.

As the nut is tightened down on the PLI washer assembly sandwiched between two auxiliary washers, the inner ring takes the load. The outer ring is free to move until the inner ring is compressed to the point where the adjacent washer bottoms on the outer ring. At this end point the outer ring binds and the desired preload for the bolt is reached. To detect the end point, the operator wiggles the outer ring by means of a feeler handle—actually a disposable length of thin-gage wire—inserted into any one of three holes provided on the outside of the ring.

According to the manufacturer, the PLI washer technique is accurate to within plus or minus ten per cent of the predetermined load.

For further information write to the company, or use the Request Card at page 18. Circle No. 463.

Across America . . . wherever concrete meets concrete . . . first choice is



• Rickenbacker Causeway

• Cleveland Municipal Airport

• New York State Thruway

• San Francisco-Oakland Bay Bridge

• Detroit Express Highway

These Heavy-Traffic Arteries Stay Maintenance-Free with
FLEXCELL
JOINT FILLER

On bridges and airport runways, on streets, highways, throughways, and expressways . . . *wherever concrete meets concrete* . . . Flexcell Bituminous Fiber Expansion Joint Filler is *doing a job!* For joints that are free from bulges or crevices, that stay closed under severest traffic and climatic conditions, Flexcell Filler has won coast-to-coast acclaim.

In years of trouble-free performance on thousands of projects, Flexcell Joint Filler has proven a cost-saver in both initial expense and freedom from maintenance. Its secret lies in the resiliency of the tough, durable cane fiber board base. Millions of tiny air cells absorb pressure without extruding as concrete expands. When concrete contracts, Flexcell Joint Filler springs back to normal, keeping joint neatly and smoothly closed.

Simple to handle, easy to work with, Flexcell Joint Filler provides neat, finished joints without trimming. It is impregnated with asphalt to resist moisture, and protected by the patented Ferox® Process against dry rot and termite attack. Rough-textured surface means a firmer bond with concrete; it is ideal for work involving special cutting, tapering and fabricating. And over 70% "recovery" has been proved in laboratory tests!

Flexcell Joint Filler has long been specified by leading engineers, contractors, and architects . . . as well as the United States Army and Navy, and other Federal, State, and Municipal agencies. *Before* you start your next job, investigate the reasons for this nationwide preference.

Mail the coupon below for full data on the benefits and economies of using Flexcell Joint Filler for pavements, runways, sidewalks, curbs, gutters, driveways, concrete floors. No cost or obligation.

Another Famous CELOTEX *Product*

FLEXCELL
REG. U.S. PAT. OFF.

BITUMINOUS FIBER EXPANSION JOINT FILLER

The Celotex Corporation, 120 S. LaSalle Street, Chicago 3, Illinois

*Flexcell is a Trademark identifying Bituminous Fiber Expansion Joint Filler marketed by The Celotex Corp.

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120 S. LaSalle St., Chicago 3, Illinois

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WEIGHS ONLY 9 LBS.

"The Lug-All, dollar for dollar, is probably the best tool used in our outfit. In a business of expensive tools and equipment, it is a real pleasure to get a man-sized working return for a boy-sized expenditure. Our Lug-All is kept constantly on the job and in the shop and has been put to a thousand different uses" states Mr. R. L., president of a prominent contracting firm.

It will pay you to investigate this unique winch-hoist. Here are some of its outstanding features:

RUGGED FRAME—fully protects the drum and ratchet teeth, yet permits easy cleaning of simple parts.

REVERSIBLE HANDLE—is "safety valve" handle that will bend if seriously overloaded.

VERSATILITY — pull, lift, lower, stretch or tighten . . . at any angle!

AIRCRAFT CABLE—133 strand preformed and flexible, gives 5 ft. lift at 1½ ton capacity, and 10 ft. double-speed lift at ¾ ton. $35.25

Order today, or write for literature on complete line of Lug-All Winch-Hoists and Car Door Pullers. **The Lug-All Company, Haverford 2, Penna.**

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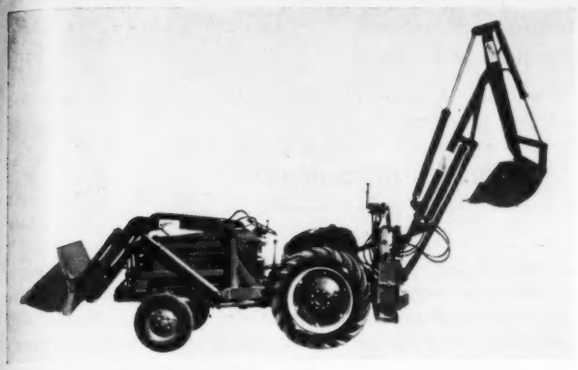

The Henry Model C-10 backhoe and Model TS-7 tractor shovel are shown mounted on the new International Model 300 tractor.

Two new attachments for rubber-tire tractor

■ The new Henry Model C-10 backhoe and Model TS-7 tractor-shovel have been officially approved by the International Harvester Co., for use on International's new Model 300 tractor. Both attachments are hydraulically operated.

The backhoe is offered with a choice of a telescopic boom digging down to 10 feet 6 inches, or a standard boom digging 8 feet deep. Both booms provide a loading height of 8 feet. The machine digs at any angle within a 160-degree swing radius.

The tractor-shovel attachment can be equipped with utility bucket, hoisting crane, dozer blade, or fork lift.

For further information write to Henry Mfg. Co., 1700 N. Clay St., Topeka, Kans., or use the Request Card at page 18. Circle No. 551.

Semiautomatic transmission has eight forward speeds

■ An 8-speed semiautomatic Roadranger transmission with all-air range shift control has been designed for on-and-off-highway trucks of 150 to 200 horsepower. Made by the Transmission Division of Fuller Mfg. Co., Kalamazoo, Mich., the new Model R-46 transmission has all eight forward speeds controlled by a single shift lever. All speeds are in selective ratios, progressively spaced at 38 per cent steps.

Shifting is made easier by the all-air-range shift control, which has the same preselective features as Fuller's original air-electric system. The shift is basically an air valve with controlling cable, which takes the place of selector switch, selector-switch harness, rotary circuit switch, and solenoid valve used in the air-electric system.

Since gear-splitting is eliminated, rpm loss is reduced between shifts, and engine lugging is kept to a minimum. This enables the vehicle to move faster on less fuel, and keeps it in better control on grades and in traffic. The transmission takes up less space than a conventional transmission and auxiliary.

For further information write to the company, or use the Request Card at page 18. Circle No. 516.

Booklet on tractor lists recent improvements

■ A new illustrated booklet lists recent improvements that have been made in International TD-24, TD-18A, TD-14A, TD-9, T-9, TD-6, and T-6 crawler tractors. Featured is the new International TD-24 torque-converter diesel crawler introduced last March.

New equipment that has been added recently to the I-H line includes three new hydraulically-controlled blades that can be used interchangeably on TD-24 standard or TD-24 torque-converter crawlers; four new cable-mounted bulldozers and bullgraders for the TD-18A; and four new cable-mounted blades for use with the TD-14A.

Also shown are the International Drott line of Skid-Shovels.

To obtain this literature write to International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 443.

47% advantage for rubber over tracks

Widening road to Ohio Turnpike, 7-yd. Tournapull averages 60 yds. per hour. Slower 11-yd. crawler-scrapers average only 41-yds. in spite of 400 ft. shorter cycles.

	122 hp, 7-yd. D Tournapull	93 hp crawler, 11-yd. scraper	148 hp crawler, 11-yd. scraper
Load time self-loading sandy clay (all units in same pit)	1.2 Min.	Not timed	Not timed
Total cycle time	4.5 Min.	12.7 Min.	10.3 Min.
Haul distance one-way	1100'	1100'	1100'
Return distance	1500'	1100'	1100'
Return speed on 1000' of paved road in traffic:	14 MPH	Could not haul on pavement	
Top speed possible	28 MPH	6 MPH	5 MPH
Trips per 55-minute hour	12	4½	5½
Yards per 55-minute hour	60	38	44

The above figures are averages of a day-long time study made by field engineers on Kane, Ohoro & Haenny, Inc. 8-mile road widening job between Youngstown and the Ohio Turnpike. The 47% advantage computed for the Tournapull was called "conservative" by the contractors. Based on their experiences on Turnpike subcontracts, they estimate the one "D" will move as much dirt, over-all on this job, as two crawler-drawn scrapers combined. And here's another advantage...

D Tournapull hauls on blacktop where crawlers can't travel

Most of the time, rubber-tired "D" traveled down the 3-lane blacktop highway, spread its sandy-clay loads along either shoulder. Its high speed on rubber, plus fast-acting 4-wheel air brakes and power steer, allowed the rig to travel safely and fast through open traffic. The crawler-scrapers, on the other hand, could not haul on the pavement, and therefore had to spread all their loads on shoulder on same side of road as borrow pit.

Comparing the two dirtmovers, Company Partner Albert Haenny says, "On 90% of your work you're better off with the D Tournapull. Even on short hauls, the smaller 'D's' will move almost as much dirt as bigger units when you average it out."

Superintendent Paul Ellis agrees. "I like many things about D Tournapulls," he says. "They can travel across the road without planking and work both sides. They're fast and can get around where other rigs can't. They're worth their weight in gold on road jobs like this one."

For low-cost dirtmoving, investigate Tournapull maneuverability and 28 mph speed for yourself. Write or call us for a demonstration on your job. See for yourself what the "D" can do...either self or pusher-loaded...alone on scattered odd jobs or in fleets on big-yardage assignments.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-709-H-b

Now available — FREE — a valuable new reference book — "Earthmoving, An Art and a Science". Contains 60 pages of detailed information on how to increase output and lower dirtmoving costs. Unbiased. Written by experienced field engineers . . . checked by veteran dirtmovers. For your free copy, call your Distributor or write to LeTourneau-Westinghouse Company, Peoria, Illinois.

Send to: LeTOURNEAU-WESTINGHOUSE COMPANY, Peoria, Illinois

Your Name .....

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DP-709-H-b

FACTS ON FINANCE

by WILLIAM HURD HILLYER

"How much longer will the construction boom last?" is a question almost everyone has been asking as the annual value of construction has continued to spiral steadily upward. Actually, the question is misleading. Today's construction volume, particularly in heavy engineering, lacks all trace of being founded on a speculative boom. Work being done is filling tangible needs, and the high volume —the "boom" in construction—will continue, financial conditions permitting, until those needs are measurably satisfied.

Of three types of work included in a research analysis by the Fidelity-Philadelphia Trust Co., only residential construction shows signs of a possible future letdown. Heavy construction—on commercial and factory buildings and public works—is seen as being fairly strong. According to this report, "industrial construction is expected to continue at high levels . . . [and] governments—federal, state, and local—face a vast amount of too-long-delayed" work on sewer and water systems, highways, and other public works. The rate at which these needs will be met, the company concludes, depends chiefly on the state of local level finances.

In the first half of the year, investors poured dollars into state and municipal bond and note issues at a prodigious rate, averaging as much as $200 million weekly. Though at times the market seemed torpid, it also showed itself capable of absorbing big offerings such as the Florida Turnpike issues with unexpected ease. Late in June, however, investors seemed to lose all zest. The $58 million Texas Turnpike Authority bond issue proved a "slow mover", and within the same week, $30 million New York Port Authority 3½'s; $21 million Dade County, Fla., 3⅛'s; $50 million Pennsylvania General State Authority; and $25 million Maryland State Roads Commission bonds met with a similar lack of enthusiasm. Despite a total of $300 million in unsold bonds carried as "inventory" and $360 million in bonds still to be issued, dealers are still hopeful about the market. They regard the present difficulty as a matter of price, claiming that investors are holding out for the highest interest yields.

Money for needed improvements is not lacking. Savings which can be invested in construction are still continuing to pile up in banks. Time, or savings deposits have increased nearly $5 billion since a year ago, and of this amount, $3 billion has been invested by the banks in securities other than U. S. government obligations. Most of it has found its way into state and municipal bonds.

An important shift in financial thinking was made by the Federal Reserve Bank of Richmond when it took a favorable view of toll-highway construction. The federal government has been traditionally opposed to toll roads since early "turnpike" days, and the confidence in turnpike bonds by an institution so closely allied to government is an encouraging sign for toll-road builders.

With the exception of purchasing agents, whose National Association is disappointed at the volume of new orders, most people are encouraged by current economic developments:

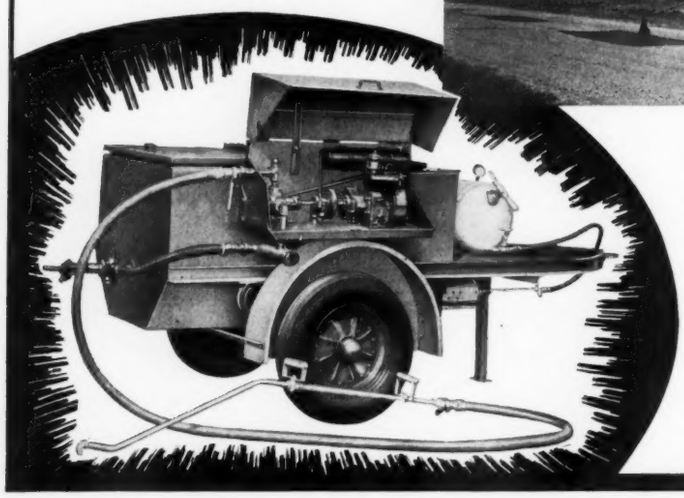
1. Public construction will touch a record $11.8 billion this year, 4 per cent higher than 1954. Commercial and industrial construction should rise 30 per cent and 8 per cent, respectively, according to the U. S. Labor and Commerce departments.

2. Bank check activity is still climbing in centers outside of New

LB LITTLEFORD 84 HD TAR AND ASPHALT KETTLE

BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE · 1905

delivers more "hot stuff" faster, at lower cost and with greater safety.



The Littleford 84 HD is designed for modern, economical road repair. Made in 3 models—(1) standard, (2) with hand spray attachment, and (3) with motor spray attachment (illustrated)—there's a type for your requirements. For complete information on the most efficient kettle you can buy, send today for Littleford bulletin X-1.

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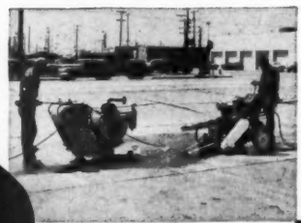
There's MORE NEW than the streamlining on the

ROCK it back... TILT it forward



FELKER Model 254 CONCRETE CUTTER

- 25 H.P. WISCONSIN!
- NEW "BLADE-SAVER" COLLARS! Pat. App. For. Trademark Reg.
- SELF-PROPELLING DRIVE!
- HYDRAULIC BLADE ACTUATION!
- CUTS TO 6¾" DEEP!
- BUILT-IN COOLANT PUMP! Many other features!

AMAZING BALANCE on front or rear wheels alone gives you a new degree of maneuverability!

No other heavy-duty concrete cutter can compare with the new Felker Model 254! See what *maneuverability* is really like! Quickly gets into and *out of* the tight spots, does all jobs without mankilling effort, turns in its own length! See how Blade-Saver Collars stretch out blade life! Try the "254" today... Ask for demonstration from your nearest Felker distributor!

NEW FOLDER GIVES DATA— Before buying any concrete cutter get these facts! They'll convince you here's the *best* buy in the whole field!

Felker Di-Met SEGMENTED TYPE BLADES

Preferred for maximum footage at lowest cost-per-cut. Wide range of bond variations for maximum life under every condition! Ask also about the new Felker Abrasive Blades for cutting green concrete, where applicable.

FELKER DI-MET SINCE 1924

FELKER MANUFACTURING CO.
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World's Largest and Oldest Manufacturer of Diamond Abrasive Cut-Off Wheels and Machines

York City. The latest total from 25 cities is nearly 14 per cent above comparable figures for 1954. New York itself registered a gain of only 1.4 per cent.

3. Incorporations are increasing at a rate of 20 per cent over last year, reflecting a growth of middle-bracket businesses.

4. Machine-tool orders are coming in so fast that a $700 million volume of new business is predicted for the year.

5. Industrial plants being built will set a $29 billion annual rate, if contemplated plant expansions occur.

6. Although construction is providing employment for an average of 10,000 more people than it did last year, there is a possibility that a shortage of construction labor may be felt in 1956. THE END

Three-wheel roller features torque converter

■ Major improvements have been made on the newest Galion three-wheel roller, according to Galion Iron Works & Mfg. Co., Galion, Ohio.

The new Chief model is available with either ballast-type rolls, in which the weight may be varied by the use of water ballast, or with non-ballast spoke-type rolls. Four sizes offer a weight range of 10 to 16 tons. Standard width of the drive rolls is 20 inches; the 24-inch width is available optionally.

Among the improvements is the Galion Roll-O-Matic torque-converter drive supplied as standard equipment. This drive automatically multiplies engine torque and provides an infinite number of drive ratios to suit any working conditions. Having no gear-shift mechanism, the drive automatically multiplies the engine driving force by means of oil in motion instead of by transmission gears. It applies the driving force as the work demands, and closely maintains desired rolling speed regardless of grade or working conditions. When the governor lever is moved to any selected rolling speed, this rolling speed will be closely maintained whether working uphill or downhill.

The Galion Roll-O-Matic torque-converter drive is reported to save up to 25 per cent in fuel, while increasing engine life by 35 per cent and the service life of forward-reverse clutches by 40 to 50 per cent. It offers rolling speeds of 0.8 to 5.5 mph, and also provides smooth engine braking power on downhill grades.

Another improvement in the Chief roller is in visibility. Space is provided under the hood for a 100-gallon sprinkler tank, and the supports for an all-steel canopy cab have been simplified and streamlined, giving the operator a greater range of vision.

Hydraulic steering, simplified controls, cab-controlled differential lock on the drive wheels, adjustable tapered roller bearings in the guide roll and kingpin, and choice of gasoline or diesel engine are offered.

For further information write to the company, or use the Request Card at page 18. Circle No. 464.

Gravity, centrifugal force improve screening action

■ Designed specifically for fine screening sizing, dewatering, dusting, cleaning, and washing, the new Symons V-screen is described in a bulletin from Nordberg Mfg. Co., Milwaukee 1, Wis. According to the manufacturer, it is the only screen that does not depend on gravity alone for its screening action.

The V-screen multiplies its screening effect by combining centrifugal and gravitational force to obtain sharp single cut, and wet or dry separations. A controlled diffused feed and vertical flow of material within a screening drum, combined with the relatively low rotary speed and high-speed gyratory action, set up a separating force that more than doubles the capacity of each square foot of screen surface, according to the manufacturer. This is said to bring the screen's efficiency up to 98 per cent while producing separations as small as 100 mesh. Since the Symons V-screen is smooth and quiet in operation, no special foundation or anti-vibration devices are needed.

Construction details and dimensions of the screen are included.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 501.

Manual describes erection of wood-fiber roof decks

■ A guide for wood-fiber roof-deck erection is available from Tectum Division, the Alliance Mfg. Co., 105 S. Sixth St., Newark, Ohio.

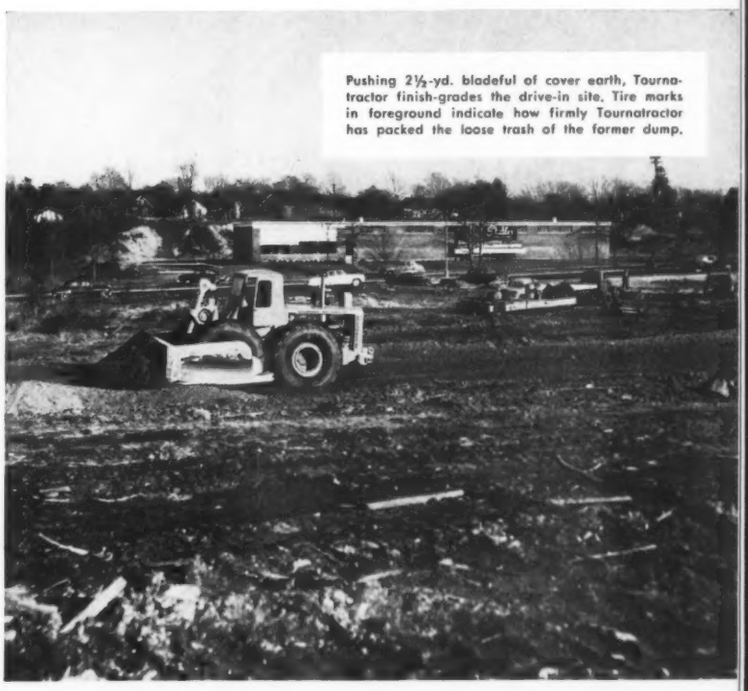
The pocket-size illustrated booklet provides clear-cut instructions for each step in the erection process. The discussion includes storage and transfer, arrangement of framing, anchorage methods, and finishing. Architectural details are also included.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 493.

"Does the work of 2 machines"

THE L & Z CONSTRUCTION COMPANY, Putnam, Connecticut, has just finished a grading job which accurately tested dirtmoving abilities of a 148 hp crawler-tractor, a 101 hp crawler, and a 186 hp rubber-tired Tournatractor.

The work consisted of turning an unsightly rubbish dump near Boston into a modern drive-in theater.



Pushing 2½-yd. bladeful of cover earth, Tournatractor finish-grades the drive-in site. Tire marks in foreground indicate how firmly Tournatractor has packed the loose trash of the former dump.

Eliminates need for roller

Of the 30,000 cubic yards of waste and trash which had to be leveled, Tournatractor alone handled half. The other 2 tractors each handled a fourth. Had the crawlers alone done the job, reports Raymond E. Leo, secretary-treasurer of the L & Z Company, sheepsfoot rollers would have been necessary. With Tournatractor on the job, big low-pressure tires so effectively compacted the trash in normal travel that rollers were not needed.

Needs less maintenance

Spreading and grading the 10,000 yards of cover dirt brought in by trucks, Tournatractor proved equally effective. Here, it dozed so fast (usually at 3.7 mph) and backed up so fast (usually at 8 mph) that it completed twice as many cycles as each of the crawlers. Says Mr. Leo, "Tournatractor did as much work on this job as the two track-type machines combined. It required less maintenance, too."

A major reason for Tournatractor's advantage over the crawlers is that it has more horsepower. Today's Tournatractor develops 208 hp . . . the two crawlers, 148 and 101 hp. Tournatractor also has more speed . . . 19 mph top, compared to 5 and 6 mph for the crawlers . . . 3.7 mph second gear compared to 2.3 and 2.2. Tournatractor also has less power loss. Its 4 rubber-tired wheels naturally roll easier than the 450 to 550 moving parts of a crawler track assembly. And the wheeled machine, with only 4 moving parts in place of hundreds, naturally needs less lubrication and less repair work.

Find out more

It will pay you to investigate *all* the maintenance and speed advantages of the LeTourneau-Westinghouse tractor-on-rubber. Let us show you Tournatractor in action so you can judge it for yourself. Call today to arrange a mutually-convenient time.

Imagine how much grit would be packed in around the idlers and rollers of your crawler's track assembly after one push through dirt like this. Because Tournatractor rolls over the dirt instead of grinding *through* it, this rubber-tired machine often gives you faster cycles and less maintenance than crawlers.

Tournatractor—Trademark T-700-8-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Now rated at 103 drawbar horsepower, the new International TD-18A is reported to be easier to operate than its predecessor. Power-train gearing, track frames, and other vital components have been strengthened to accommodate the increased power now available in the machine. ►

Redesigned crawler tractor emerges as more powerful, easier-to-operate unit

A more powerful and easier-to-operate version of the TD-18A diesel crawler tractor has been placed in production by International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Power in the new model has been increased to 103 drawbar horsepower —a boost that puts the TD-18A in the big tractor class. The drawbar pull is 24,300 pounds at a rated governed speed of 1,450 rpm.

To accommodate the increased horsepower the tractor now has a heavier power-train gearing. Six forward and two reverse transmission speeds, ranging from 1.6 to 5.5 miles per hour provide operating flexibility.

Other improvements include strengthened track frames; convenient rearrangement of control levers; positive - locking, tiptoe - action brakes; and features designed for greater operator comfort.

The manufacturer reports that the track frames on the new model have been made 300 per cent stronger than before and have machined surfaces to assure permanent fit and track alignment. This stronger, precision construction is expected to prevent undue scuffing and wear of sprockets and rollers. It will also eliminate severe track chain wear and will help to ab-

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Sizes 1¼" to 4". Maximum lengths, 50 ft. **Mail coupon for prices.**

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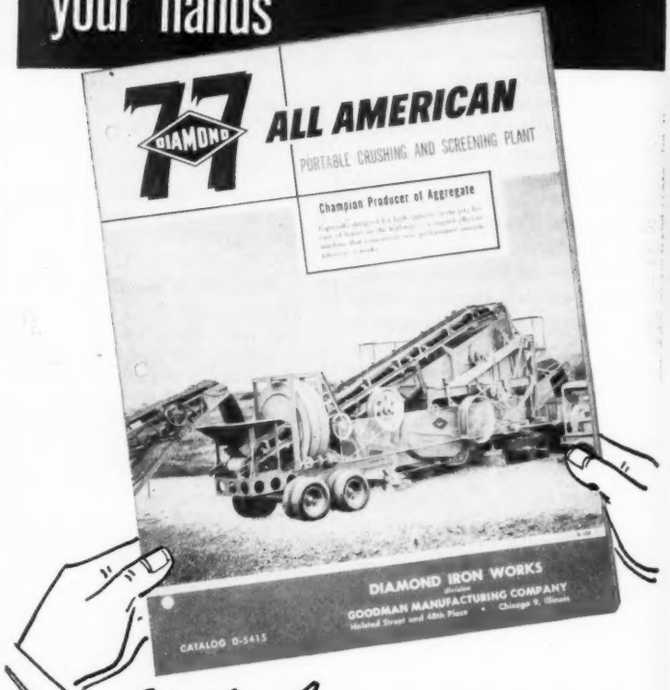

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This mobile unit is without a peer in either strength or in aggregate producing ability. Learn how Diamond's line-flow, rotor-lift principle can give you high crushing capacity and uninterrupted flow of material.

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sorb heavy shock loads without damage to the equipment.

The new box-section track frames strengthen the three-point track suspension system, an exclusive feature of International crawlers. Track frames are kept from tilting by heavy steel arms that connect the frames with the pivot shaft by special bearings. The track frames are mounted at the ends of the pivot shaft by ball-and-socket joints, designed to eliminate leverage loads from the pivot shaft.

The front stabilizer keeps tracks in proper lengthwise alignment and virtually eliminates leverage loads from the track frames. Individual track oscillation provides maximum track-to-ground contact on grades or rough terrain.

Features designed for operator comfort include a wider, foam-rubber truck-type seat; a roomier, unobstructed operator's compartment; and a streamlined dashboard. A new rectangular air cleaner—which has been made 17 per cent larger—has been placed under the hood to give the operator unobstructed visibility.

Also making the TD-18A easier and safer to operate are positive self-energizing brakes designed to respond instantly to tiptoe pressure. The brakes are full-wrapping, with 13 per cent more effective friction area than before. There is a brake pedal for each track.

The rearrangement of the control levers has put the steering levers and the master clutch lever on the left side. An improved engine-starting changeover lever is now operated with the left foot. A new, ratchet-type throttle is situated on the dash, within inches of the left hand. The gear shift and forward and reverse levers are compactly arranged on the right.

New steering clutch hand-lever boosters provide fingertip steering control for greater maneuverability. The hydraulic booster pump runs all the time, and does not depend on master clutch engagement. Each steering clutch has its own individual pump, with full booster oil pressure always available.

The TD-18A is powered by a four-cycle, valve-in-head, six-cylinder diesel engine. There is a 12-volt electric starting and lighting system. Fuel tank capacity has been increased to 75 gallons.

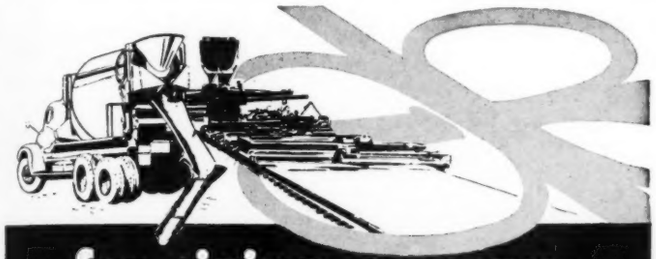
The tractor is 158¼ inches long and 96 inches wide with 22-inch shoes. It comes with regular or extended track frame. Operating weight with the former is 24,585 pounds, with the latter, 25,605 pounds.

For further information write to the company, or use the Request Card at page 18. Circle No. 520.

Cartography jobs open

A Civil Service examination for Cartographic Survey Aid with mobile field units in the U. S. Coast and Geodetic Survey has been announced.

Salaries range from $2,500 to $4,205 per year. Further information and application forms may be had from local post offices or the U. S. Civil Service Commission, Washington 25, D. C.



for sizing accuracy
Specify GILSON

The GILSON Mechanical Testing Screen provides an accurate check on sizing specifications for crushed stone, gravel, slag, coal, ores, and all similar materials.

RUGGED, FAST, AND ACCURATE
HANDLES UP TO ONE CU. FT. OF SAMPLE
MAKES TEST IN 5-MINUTES OR LESS

A GILSON Test Report from a supplier is a guarantee of right quality. On-the-job testing with GILSON cuts out errors and guesswork, saves time and money.

Specify GILSON and get what you want on every job

Write for additional information

Here's why GILSON belongs in your sizing specifications:

1. Makes tests quickly and accurately
2. Two to seven separations simultaneously
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5. Visible separation to refusal
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8. Size range 4" to 200-mesh

A Sand Attachment for handling 8-inch sieves is optional equipment with the GILSON Screen.

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Malinta, Ohio

NAME

TITLE or POSITION

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RENTED and SOLD by distributors everywhere

Trenching operations

This is the fifth in a series of articles consisting of selected excerpts from the 1,280-page book, "Moving the Earth", by Herbert L. Nichols, Jr., published last March. Priced at $15, the book is available through the Book Order Department of CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, N. Y. A copy may be ordered on approval by circling No. 1 on the Request Card at page 18. Approval copies will be billed at $15 plus postage.

The most important dry-ditching machines are hoe and clamshell attachments for revolving shovels, and wheel and ladder-type ditching machines. In soft swamps, draglines are the preferred tool. Dipper sticks, draglines, graders, and bulldozers may be used for shallow trenching in the dry.

A bucket used in cutting narrow ditches should be wider at the cutting edge than at the back, either through taper of the sides or attachment of side cutters, so that it will not bind between the walls of the ditch.

Ditching with a hoe (dragshovel) is easiest and neatest if the ditch is the same width as the bucket cut. This permits the machine to stand over the center line with the tracks parallel to it and dig a straight-sided ditch by peeling the dirt off in layers.

When the desired depth is obtained along the space the shovel can reach, the rig is walked away from the ditch from 2 to 12 feet, and a section of that length excavated. Short moves are made in connection with deep ditching, cutting the bottom to an exact grade, or cutting curves; longer moves are feasible for rough shallow work.

Curves are dug as a succession of short straight ditches, but a skilled operator can bevel the edges to produce a smooth curve. The machine stands with its center a little outside of the center line, and digging is done in the outer half of the bucket reach. Moves are short.

Many kinds of pipe require laying in straight lines and angles rather than curves, and trenches in which they are to be placed are dug accordingly. Angles are made by digging slightly past the angle point, then shifting the shovel to straddle the new center line.

Spoil from the ditch is usually piled on one side, far enough back to allow a footpath or working space between it and the ditch. If a large volume of dirt is being moved, the pile must be pushed back by the bucket as it is built, and in addition, it may be necessary to allow the spoil to come to the edge. Piling on both sides is usually avoided because of backfilling work. It does serve to block off the ditch so that people are less likely to walk into it absentmindedly or in the dark, although it is not adequate barricading.

Side digging

A hoe should be worked away from the end of the ditch that is blocked. In ditching from a house to the street, work starts at the house and finishes in the open space of the street. However, it often happens that a ditch must be dug between two buildings, or under other circumstances where both ends are blocked.

The simplest method of accomplishing the necessary turn-around is to dig the ditch from one end, then from the other, having the sections meet at some spot where the shovel can move off to the side. The digging of the second section should be stopped while there is still ample room to turn the shovel and get it out. The shovel is turned at right angles to the ditch and walked back into the undug space, with its center pin in the center line of the ditch. It then digs as close to its tracks as possible on both sides and backs away, connecting the ditch sections by digging at right angles to them.

This method involves making a connection which is very wide in proportion to depth, and is therefore wasteful of machine time, unless a spot is chosen where use can be made

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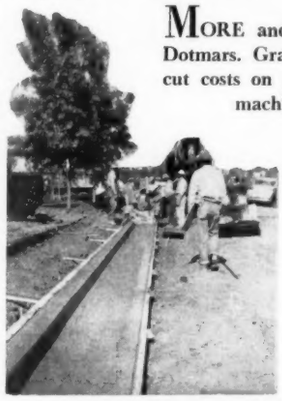

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of the width, as in building a pump house or manhole.

When a ditch is to be more than one bucket width, one or both edges will be slightly uneven because the bucket will move inward, toward the center pin of the shovel. Usually one side is made straight by lining the shovel to that side, and the hacking done on the other side. If neatness is important, the ridges can be smoothed by drawing the bucket in while lightly swinging against the edge.

The full width of the ditch should be taken off in layers if it is to be dug from one position, rather than cutting one side to depth and then starting on the other.

In shallow trenches with spoil piled at one edge, cycle time is fast—15 seconds or better—but the bucket fills poorly and frequent moves take time.

In narrow ditches, yardage per foot is less but bucket efficiency is low. In deep work the bucket fills well and moves are infrequent, but the cycle is slower.

In good ditching conditions, the hoe may move from 50 to 100 per cent as much dirt as a dipper shovel loading trucks.

Separating topsoil, digging hard soil, cleaning off rock, watching for pipes or conduits, and cutting curves and angles take longer. In soft ground, speed depends on the crew setting the bracing.

Other shovel rigs

A clamshell ditches best when on the center line. If the ditch is narrow, the tagline chains are fastened to one jaw, or for a very wide cut, to both jaws. A ditch of intermediate width is made with the chains in the one-jaw position, and the soil is taken out in layers.

Smooth curves may be dug either by frequent readjustments of the position of the shovel, in the same manner as with a backhoe, or by having a man on the ground twist the bucket into proper position by pushing it by hand or with a stick as it is about to touch the ground.

The dragline is the preferred shovel for ditching in swamps, and for making ditches with sloped banks when the spoil is to be piled alongside. It works along the center line of the ditch, cutting the bottom and slopes in one operation. If the ditch is too wide for this, two cuts are made from the sides.

If the fill is to be trucked away, a dragline or backhoe may be used in this manner. Draglines may have difficulty digging hard earth which the hoe would move easily.

The dipper can dig trenches 4 to 7 feet in depth from the top, or wide trenches from the inside. A neat ditch may be dug from the top by straddling it, if the soil is very firm, or if support platforms are used. Trenching may also be done beside and parallel to the shovel's path, but this involves quite a wide cut in proportion to depth and is difficult to trim.

Interior digging conforms in general patterns to that discussed for cellars in the previous chapter (see "Excavating for Foundations," C&E, July, pg. 118.) Part-swing shovels can dig narrower slots than conventional models, as they do not need space for tail swing, but they cannot load trucks behind them.

The hoe is the best machine for ditches of moderate depth and width where boulders or stumps may be encountered. It will break up heavily fractured hard rock, and soft or thin bedded shale, and dig very hard soils if the bucket teeth are long and sharp. It can dig out large boulders by widening the trench as much as necessary, and dragging them up the slope toward itself. The ditch can be easily curved around boulders that are too

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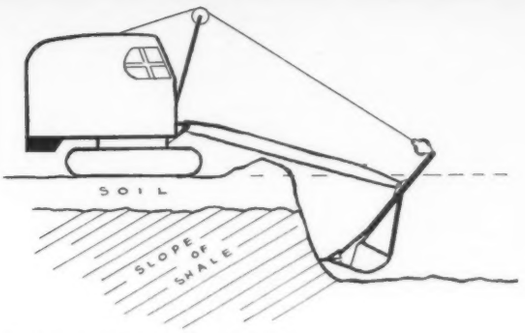
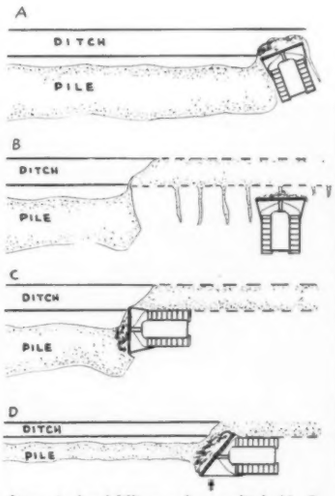


The best angle at which to dig shale.



Steps in backfilling a large ditch (A, B, and C), and a simple procedure for backfilling a small trench (D).

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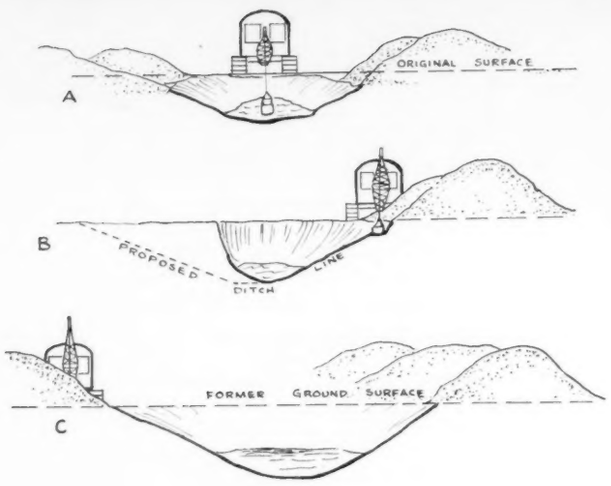

Wide ditching with a dragline. The bottom and slopes may be cut in one operation from the center line of the ditch (A), or two cuts may be made from the sides (B and C) if the ditch is too wide for a single cut.

large to lift or pull.

The clam is a slower machine but is able to dig to any depth desired, and can work close to obstructions, except overhead ones. If fitted with a bucket of sufficient weight, it will dig hard soil and soft rock. It can pick up moderate size boulders in its bucket, and lift larger ones up to its capacity by chaining.

Ditching machines

Ditching machines are often preferred for use in localities where boulders are rare or lacking. They dig by continuous picking rather than by the dig-and-dump cycle of the shovel. They work rapidly; make a neat ditch, usually with a curved bottom which is helpful in lining up pipe; can work with less headroom; and do not need space to swing. They can dig certain classes of homogeneous soft rock which a shovel cannot, and will not tear up the banks in soft shale. Buckets may be obtained in various widths, including sizes much narrower than practical for a shovel bucket. A ditcher cannot readily make a ditch wider than the longest side-cutters available for the buckets it is using, unless the boom is built to hold two sets of ladders and buckets.

Ditchers can be equipped with shoes or reels to lay tile or flexible conduits immediately behind the digging so that shoring is not necessary.

Graders can make shallow ditches with sloped sides rapidly and neatly. If a ditch is to be dug by a grader without building anything with the spoil, the same processes can be followed with the spoil cast in both directions.

The bulldozer can dig a wide and shallow trench from the side. The volume of excavation required increases very rapidly with depth because of space needed for ramps.

When the practical limit for side excavation is reached, the dozer can work in the ditch, pushing dirt into heaps, which it then pushes to the side.

An angling dozer can excavate by side-casting in the same manner as a grader, but it may be harder to keep lined up.

Stripping

Ditching frequently turns up rock that is too resistant to be dug by the available equipment. Occasionally the line of work may be shifted, but it is usually necessary to blast.

Dirt and rotten rock are removed by conventional methods. Spoil should be piled far enough back to allow space for the drilling equipment, and for the shovel when it returns.

After machinery has removed the soil, the rock surface should be cleaned by hand. If the trench walls are liable to crumble and slide from drilling vibration, they should be shored up, even if depth is shallow.

Jackhammers can be used with the operator standing on the rock, or on the ground surface beside the ditch. Wagon drills are stationed on the bank. Special ditching drills may be suspended over the work by cranes.

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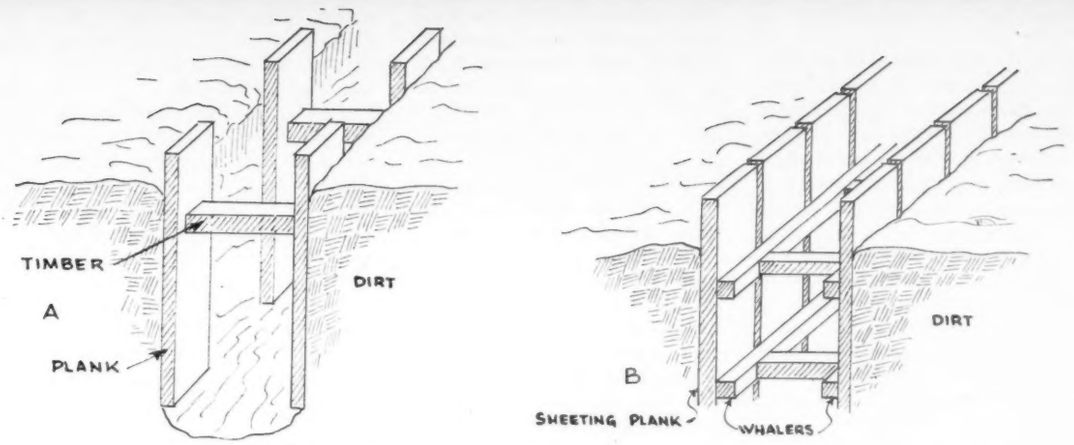

Light (A) and heavier (B) shoring methods for bracing trench sides.

Blasted rock may be dug from the trench by machine, by hand, or by both methods.

If the ditch is narrow, with hard, irregular walls, projecting stubs may jam a bucket so frequently that hand work may be cheaper. A bucket or container is frequently loaded by hand and hoisted by a machine. Large rocks are lifted with slings or tongs.

In general, it is good policy to blast sufficient width to insure working space for a clamshell or hoe bucket.

Caving of banks

Many soils will not stand in vertical walls; consequently the sides of the ditches must be either sloped back or braced. A few soils will not stand on even a moderate slope, and these will require very heavy bracing.

Ground water is the most important single factor in collapse of edges of cuts. It acts as a lubricant that en-

(*Continued on next page*)

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ables the soil particles to move on each other readily, and exerts pressure that moves the particles toward the ditch. Sand faces may fall from this cause, or from the drying action of water draining and evaporating, so that the bond between the grains is weakened.

If water is allowed to stand in a ditch, danger of caving from flow of ground water into it and from other dynamic forces acting in the soil is reduced. However, wave action set up by dropping of stones or chunks of dirt may cut into the walls and undermine them.

It may happen that the upper part of a trench wall will be firm dry material, but that a shallow layer at the bottom is waterlogged and unstable. The sides will stand for only a short time before becoming undermined by movement of the lower layer.

In general, caving of ditch sides is more apt to happen some time—hours or even days—after the digging than immediately. The exceptions are usually loose sandy or semiliquid muds that flow into the excavation, rather than cave or slide into it.

Sloping of sides for stability is a technique chiefly used for permanent open ditches. It is seldom used for trenches for burial of pipes because of the large amount of extra digging, the space required, or the area of pavement, lawn, or other surface disturbed.

Vertical trench walls may be stabilized by bracing, draining, freezing, or chemicals. Bracing is the most common technique, and may be required by law.

The method of placing the braces is determined by the promptness with which the banks are expected to collapse. If they are so stable that the necessity of bracing is questionable, the ditch may be dug by shovel or ditcher, closely followed by the carpenters who build the bracing in place as a completed structure, as close against the sides as is practicable.

If the banks are not trustworthy, or the contract calls for immediate bracing, the ditch is made sufficiently wider than the bucket so that it can work between the wales. The ditch is dug to a depth of about two feet, full width, the top pair of wales placed, and cross braces set with such spaces that the bucket can get down between them. Planks are set vertically, touching each other outside the wales.

Flowing banks

If the sides are so unstable that they cave or flow immediately upon being cut, the sheeting planks must be driven down by air hammers or pile drivers, and the dirt dug from between them afterward. Penetration and control of direction are usually best if the planks are driven only a short distance below the digging. However, mud may flow so readily that the sheeting must be down several feet below excavation level to prevent it from swelling on the bottom. All graduations between this condition and stable banks may be encountered in a short distance.

Only wet ground or loose sand exerts very heavy thrusts against the shoring. Water draining down the sides of a braced trench may erode them, so that the sheeting moves outward, thus loosening the cross beams or jacks and allowing them to fall. After this the sheeting can be pushed in by any movement of the banks.

Where shoring is difficult and expensive, it may be economical to dry up the area with wellpoint pumping, or to seal and stabilize the banks with injections of chemicals.

The spoil piles from a ditch are apt to interfere with local surface drainage. If the land is flat, spoil may be piled on both sides, but frequent breaks should be made in the windrows so that water will not pond behind them. If the ditch cuts across a slope, these breaks need be made in the upper pile only. Until the ditch slope is protected by vegetation, gullies may form at these spots unless the area is protected by pipe, flumes, or stone.

Pipes and conduit trenches

Most trenches are dug to bury pipes or conduits. Conduits, and pipes for gas and water supply, run at more or less fixed depth below the surface. Sewers, storm drains, and other gravity-flow pipes must maintain a minimum gradient from source to outlet or booster pump, and will have a variable depth below an irregular surface.

In cold-winter areas, water pipes are laid below the frost line in the ground. Conduit and wires are laid only deep enough to protect them against accident. In either case, depth may be increased under sharp ridges to provide smooth vertical curves.

Depth is usually specified in a contract, or chosen according to local custom. Items to consider in arriving at it include, in street work, possibility of repaving with a thicker pavement with very high loads on the subgrade during construction, or of lowering the street surface. In fields, the most important menace is the moldboard plow, which penetrates 8 or 10 inches. There is a chance that a subsoil plow, with a penetration of 18 inches to 2 feet, might be used, and in addition land even on gentle slopes gradually washes away, and the surface may be lowered several inches during the life of the conduit. Depths of 2 to 4 feet are usual, and are figured from the surface of the ground regardless of slope.

Since the bottom of such a ditch follows the surface at a fixed distance, depth measurements during digging are easily made. A rule or marked pole is set vertically at the side, or a board is placed across the ditch and its distance from the bottom measured.

If the depth requirement is only approximate, a mark on the stick of a backhoe, the cable of a clamshell, or the depth gage of the ditcher may be sufficient guide.

Backfilling

Trenches dug for laying of pipes or conduits must be backfilled when the installation is complete. The dirt taken out is pushed or pulled back in. This job can be handled by most earthmoving machines, but the bulldozer is the standard tool for the purpose.

If the backfill need not be compacted from the bottom up, it may be pushed into the trench. The bulldozer operates at right angles to the trench, taking as large a slice of the pile as it can handle comfortably. Dirt which drifts across the blade is left in windrows that are pushed in a separate series of passes. Any remaining soil is pushed parallel with the ditch into the main pile or, when the end is reached, distributed along the ditch.

There will usually be too much soil because of increase in volume of disturbed soil, and space occupied by the pipe laid. The excess may be mounded up over the trench and partly compacted by use of a roller or by driving the dozer or a truck along it. Full natural settlement may take as much as a year, and is liable to leave low and high spots to be graded in.

If the trench is small, it may be refilled by running an angle dozer or a

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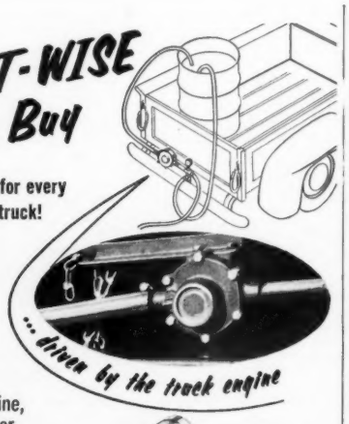

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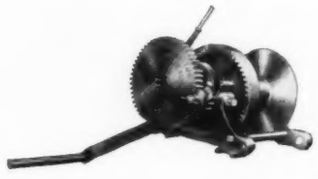

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grader through the pile, with the blade set to side-cast it into the ditch.

Heavy backfill may be done by a dipper shovel walking through the length of the pile, digging it, and dumping in the ditch. A backhoe or a dragline can work from across the ditch, pulling the soil into it. A dragline's efficiency will be greatly increased by fastening a heavy plank or other block across the mouth of the bucket so that it will not fill. Shovels are often used to move the bulk of the backfill, with a bulldozer doing the final cleanup.

If a pavement is to be laid over the refilled trench immediately, the backfill must be carefully compacted from the bottom up. This may be done by dozing or hand-shoveling fill slowly, while men in the trench compact it with hand or pneumatic tampers. A mechanical tamper may work from the side or straddle. The top layer may be compacted by use of a trench roller with a large wheel that will fit inside the ditch, or by running any heavy machine back and forth along it.

Open-textured soils may be effectively compacted by puddling. Enough water is added to the fill to make it into mud, which, upon drying, will shrink considerably. Heavy soils take a long time to dry so are not as readily handled this way.

Machinery should not be run along wet trench fills, as it is almost sure to get stuck in them.

Drainage trenches are often refilled with porous material differing from that excavated. The spoil of the original digging is trucked away or used in grading, and the gravel trucked in for refilling. This may be dumped in piles in and alongside the ditch, and pushed into it by a dozer or grader, or hand-shoveled. If considerable work of this type is to be done, a backfilling machine may be profitably used. This carries a hopper that is moved parallel with the ditch by rubber-tire driving wheels. Trucks dump into the hopper, from which a belt carries the soil to the ditch and dumps it. The backfiller can push the truck which is dumping into it, so that the truck driver can concentrate his attention on lifting the body at proper speed.

(To be continued next month)

Small shovel-crane unit can be easily converted

■ The Jobmaster, a 1½-cubic-yard power shovel or 13 to 15-ton capacity crane, is the newest and smallest unit placed on the market by the Construction Equipment Div. of Baldwin-Lima-Hamilton Corp., Lima, Ohio.

The machine can be converted to shovel, crane, dragline, or pull-shovel use, and is available with crawler or rubber mountings. On a truck or wagon mount, the Jobmaster has a 15-ton lifting capacity at a 10-foot radius; as a crawler crane, its lifting capacity is 13 tons at a 10-foot radius. When used as a shovel, the Jobmaster is equipped with a 16-foot 6-inch boom and a 13-foot 3-inch dipper handle. Crane booms, either bolt or pin-connected and with all-purpose point shaft, can be had in lengths from 30 to 80 feet and can be equipped with a 10-foot jib.

Standard features of the Jobmaster are machine-cut gears; large diameter brakes and clutches in the hoist, crowd, retract, swing, and propel mechanisms; independent boom hoist and engine-controlled boom lowering; differential tractor-type steering; independent combination chain and cable crowd and retract; internal-external tooth jaw clutch; antifriction bearings; heat-treated ground shafting; and floating steel-disk-type dirt seals in the tread rollers. Independent propel, auxiliary third drum, and power-load lowering can be had optionally.

The Jobmaster can be used as a 1½-cubic-yard power shovel or 13 to 15-ton capacity crane. ▲

Although maximum over-all length of the standard crawler truck is 10 feet 2⅛ inches and the over-all width is 8 feet with 16-inch treads, a wider and longer unit is also available for special work.

The machine can be equipped with treads in three widths. Six conical rollers, four in front and two in the rear, are on the rubber-mounted units and on machines with the large trucks. These rollers are mounted on antifriction bearings. Counterweight combinations and either diesel or gasoline power plants can be used with the rig.

For further information write to the company, or use the Request Card at page 18. Circle No. 499.

Flexible Steel promotes

Donald J. Beach is a new field representative in Michigan, Indiana, and western Kentucky for Flexible Steel Lacing Co., Chicago, Ill., maker of conveyor-belt fasteners.

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THE NEW DORSEY LOW BED TRAILER

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Typical loadings show versatility of flat-type gooseneck Dorsey HTS low bed trailers which are delivered ready for work with brakes, recessed lights, tool box as standard equipment. Grader ramps are optional at extra cost.

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WEATHER CHARTS

The weather outlook for September

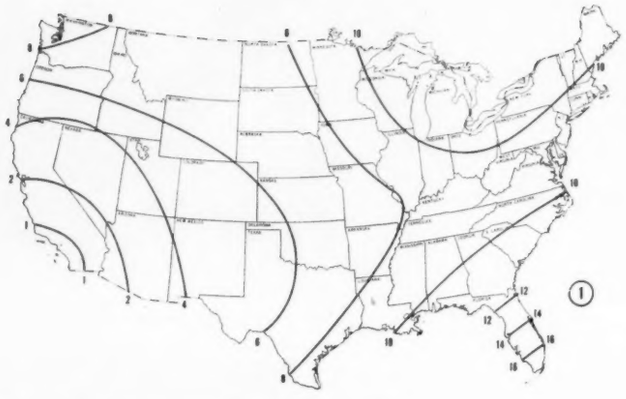

Chart 1. Days with .01 inch or more of precipitation.

Chart 2. Days with 1 inch or more of precipitation.

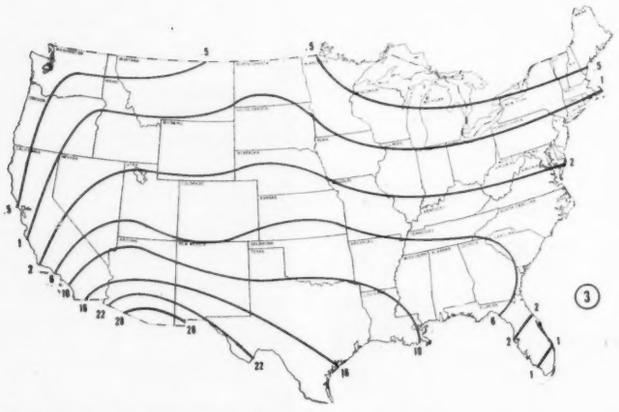

Chart 3. Days with temperatures of 90 degrees or higher.

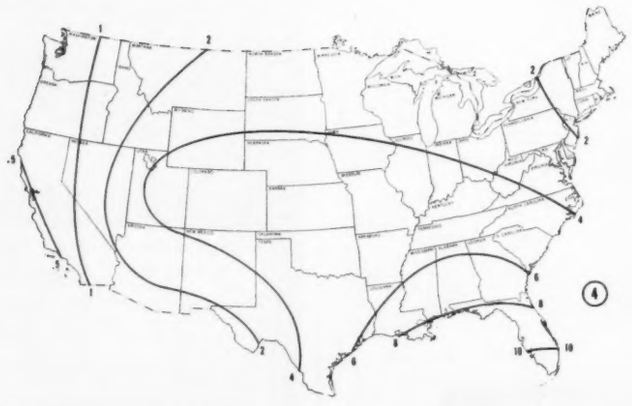

Chart 4. Days with thunderstorms.

The average weather picture for September is presented by the accompanying four maps, which indicate the average occurrence of precipitation, temperatures of 90 degrees or higher, and thunderstorms during the month.

Numbered black lines on the charts indicate the average number of days on which the weather condition represented by the particular chart may be expected to occur in a given area. When the number of days is given as a decimal value, such as .5, .25, or .1, the condition may be expected to occur only once every 2, 4, or 10 years, respectively, in the areas through which these lines are drawn.

If a contractor in Madison, Wis., for example, must complete a job by the end of next month, he will consult Chart 1 to determine the average rainfall for the month. The average for September is 10 days of rainfall (.01 inch or more), according to the chart; therefore, the contractor should assume that he will have only 20 working days during the month. If he needs more work time, the odds are against his completing the job on time.

These charts, prepared for CONTRACTORS AND ENGINEERS by Weather Corporation of America, are not specific forecasts. Rather, they represent averages based on weather-station records throughout the country for the last 60 or more years.

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AUGER DIAMETER		DEPTH OF BORE
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16	"	40-60 "
12	"	60-80 "
8	" and under	100 "

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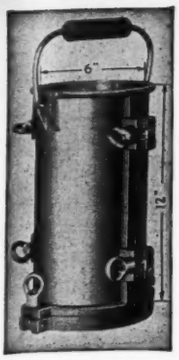

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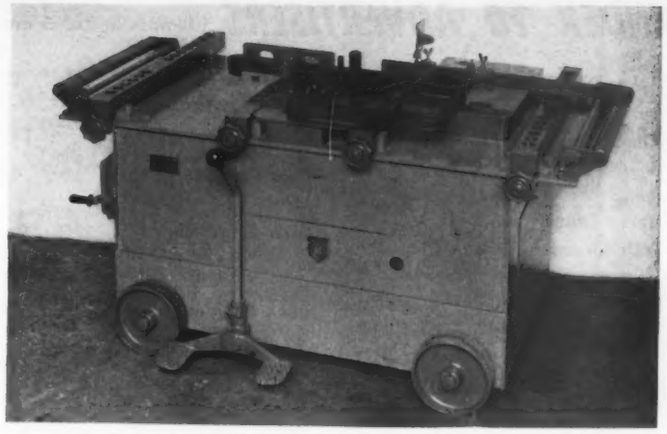

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THE PORTABLE TUSKY hoist shown here erected to a height of 62½ feet is available from Tubular Structures Corp. of America, 2960 Marsh St., Los Angeles 39, Calif. The basic unit, which discharges at a maximum height of 20 feet 2 inches, can be towed by an ordinary passenger car or pickup truck and can be erected by one man in less than two minutes. The hoist is hydraulically operated, eliminating the need for a conventional clutch and brake, and thereby reducing maintenance problems. For further information write to the company, or use the Request Card at page 18. Circle No. 474. ►

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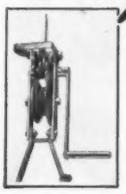

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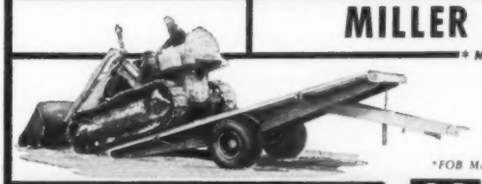

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MANUFACTURER MEMOS

Executive vice president elected by The Texas Co.

A vice president of The Texas Co., James W. Foley, has been elected executive vice president of the New York, N. Y., firm. He is also a director of the organization and of seven other firms in the petroleum field.

He came to The Texas Co. in 1932, and held various positions in the organization.

Bauer is vice president of Diesel Energy Corp.

Appointed vice president of Diesel Energy Corp., New York, N. Y., is Maximilian B. Bauer. He has also been elected a director of the company, a firm engaged in the importation, distribution, and sales and servicing of diesel engines from Kloeckner-Humboldt-Deutz AG, Cologne, Germany.

Pettibone Mulliken Corp. elects new vice president

Herbert J. Knudten has been elected a vice president of Pettibone Mulliken Corp., construction machinery manufacturer of Chicago, Ill.

Mr. Knudten will also continue in his former capacity as president of Universal Engineering Co., Cedar Rapids, Iowa, a Pettibone subsidiary. He has been with Universal since 1946, when he joined the firm as treasurer. He was made president of the organization since the latter part of that year.

The new vice president of Pettibone-Mulliken Corp., Herbert J. Knudten.

Official takes post at Koehring subsidiary

M. O. Messenger has been appointed a new vice president and general manager for Koehring-Waterous, Ltd., Brantford, Ontario, a Canadian firm which has been operating as a wholly owned subsidiary of Koehring Co., Milwaukee, Wis., since 1953. The subsidiary manufactures Koehring excavators, cranes, and road-building equipment.

U. S. Rubber Co. elects vice president

Last month, G. Allen Lovell took up his new duties as vice president of the United States Rubber Co., New York, N. Y., and as general manager of its mechanical goods division.

Formerly assistant general manager of the division, Mr. Lovell has been with the firm since 1918 in various capacities. The mechanical goods division makes conveyor belts, transmission belts, and allied equipment.

G. F. Dixon, Jr., becomes president of Dart Truck

Succeeding Furber Marshall as president of Dart Truck Co., Kansas City, Mo., is George F. Dixon, Jr. A division engineer in the South Pacific during World War II, and later district engineer of the U. S. Army Corps of Engineers in Vicksburg, Miss., Mr. Dixon has also served in Washington, D. C., as assistant chief of civil works for river and harbors.

Mr. Marshall, who will become chairman of the board of directors, is president of the Carlisle Corp., Carlisle, Pa., a Dart subsidiary.

George F. Dixon, Jr., recently elected president of Dart Truck Co.

Support of these slab forms was quickly and easily accomplished from above with the Richmond Free Fit Hanger Frame-Ty. (Bridge above Ardsley over Saw Mill River Parkway—part of New York State Thruway construction; Raylin Construction Corp. and The Lynn Corporation, general contractors.)

Study of Slab Form Support Shows Savings with Richmond System

By what standards do contractors measure the effectiveness of flat slab form support methods? Which support systems are proving most helpful?

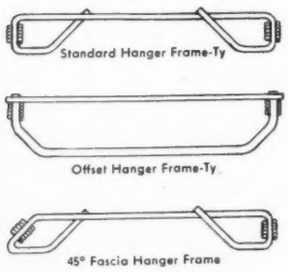
A survey brought out the following facts: *experienced contractors measure the effectiveness of flat slab form support systems in terms of three things: the degree of speed, safety and economy which they bring to a job.*

Loose wire is no longer used extensively because it meets none of the above three requirements. The use of wire beam saddles also is becoming less common. Although prefabricated to size, they are non-adjustable, and there is no positive means of tightening against the steel to prevent leakage of concrete.

Posting or "horses" are still used but this method is comparable to bracing wall forms. Prefabrication costs are high and erection is slow because of wedging and nailing usually required at the bottom flange of the beam. On high structures and deep beams this procedure is dangerous because the men have to reach down to the bottom flange to make the final tightening adjustment.

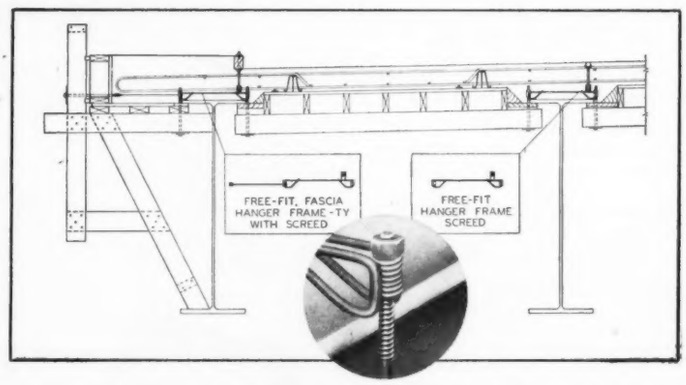
Richmond Hanger Frame-Tys are ideally suited to hang this type of construction. These units in Standard, Free Fit or Offset types (see illustrations) can all be adjusted for various slab heights and haunch conditions. Their established safe working loads enable the contractor to take full advantage of lumber strength and hanger capacity.

Richmond Standard and Offset Hanger Frame-Tys can be erected with a minimum of reaching under the *top* flange of the beams. Richmond Free Fit Hanger Frame-Tys have an additional advantage: all tightening is done from the top of the hanger by means of the nuts (see circle in large illustration), the Tylag passing freely thru an oversized coil.



Dual uses of these Richmond Hangers have become standard: Fascia Hanger Frame-Tys used not only to hang the forms but also tie in the Fascia Ty; a variation of this is the 45° Fascia Hanger Frame for light overhang, where one 45° bolt supports the fascia overhang and hangs the form; Hanger Frame Screeds combine support of the deck forms with an adjustable base for screeding or supporting curb forms.

Richmond Hanger Systems have reduced the contractor's overhead in time and materials, added safety to his operation and improved the quality of his work. The various types of Richmond Hanger Systems and their applications are detailed in the 1955 Richmond Catalogue. Write for your copy. Or, if you have specific concreting problems, Richmond's Technical Division or field men will be glad to advise you. Write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 S. 4th St., St. Joseph, Mo.



Above, R. K. Mangan, president and general manager of the Buda Division and, at right, B. S. Oberlink, vice president and general manager of the Construction Machinery Division of the A-C tractor group.

Allis-Chalmers realigns operating divisions

To meet the increased demands made upon the company by growing markets, Allis-Chalmers Mfg. Co., Milwaukee, Wis., has realigned its operating divisions.

Of the six divisions, three will be in the industries group, formerly known as the general machinery division. The remaining three, formerly called the tractor division, will be in the tractor group.

J. L. Singleton heads the industries group and W. G. Scholl heads the tractor group. Both men are vice presidents and directors of the company.

The three new divisions in the tractor group are the farm equipment division, headed by L. W. Davis, the construction machinery division, and the Buda division. Boyd S. Oberlink is vice president and general manager of the construction machinery division. R. K. Mangan will continue as president and general manager of the Buda division.

Sonneborn appoints Baer division general manager

Alvin S. Baer has been appointed general manager of the building products division of L. Sonneborn Sons, Inc., New York, N. Y., a petroleum refining and chemical manufacturing concern.

Mr. Baer will handle sales and administrative activities of the Sonneborn division which manufacturers technical coatings, concrete admixtures, surface treatments, paints, and water-repellent compounds.

Alvin S. Baer the new general manager of the building products division, L. Sonneborn Sons, Inc., New York, N. Y.

The new vice president of engineering at D. W. Onan & Sons Inc., James C. Hoiby.

D. W. Onan appoints engineering vice president

D. W. Onan & Sons Inc., Minneapolis, Minn., manufacturer of electric generating equipment, has appointed James C. Hoiby vice president in charge of engineering. In his new position, he will be responsible for the newly reorganized engineering division, including both product engineering and development and design. In addition, he will supervise operations in the experimental and drafting departments.

Formerly chief engineer of the firm, Mr. Hoiby has been associated with Onan since 1934.

ODOGRAPH Does Survey Work Usually Requiring Weeks...in Just Hours

U. S. Corps of Engineers (surplus) Odograph M-1 mounted on your jeep or truck automatically maps the course followed by the moving vehicle. Mapping proceeds at normal road speeds.

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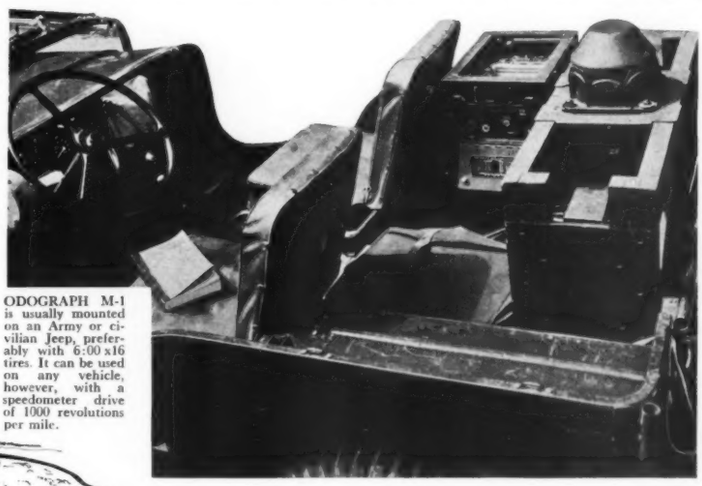
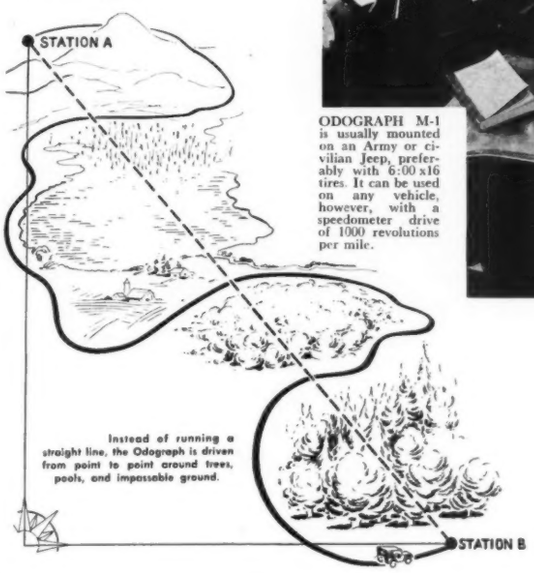


ODOGRAPH M-1 is usually mounted on an Army or civilian Jeep, preferably with 6:00 x16 tires. It can be used on any vehicle, however, with a speedometer drive of 1000 revolutions per mile.


STATION A
STATION B
Instead of running a straight line, the Odograph is driven from point to point around trees, pools, and impassable ground.

ODOGRAPH M-1 consists of three units: plotting unit, compass unit, and power pack, along with its electrical and flexible drive cables, spare parts, and accessories. Installed weight: 200 pounds.

MAP may be plotted on regular 8½ x 11 sheet or 10½-inch-wide 10-foot roll of 10 x 10 one-inch green grid paper contained in the plotting unit. A detailed map may also be placed in the plotting unit over which the course traveled is traced.

SCALE: Any scale from 1 to 20,000 to 1 to 500,000 on the Monroe model and 1 to 20,000 to 1 to 800,000 on the IBM model may be plotted, giving a map area of from 2.40 x 3.15 miles to 60.1 x 79.40 miles on the Monroe or 2.40 x 3.18 to 96.16 x 127.04 on the IBM model.

Determining ***Direction*** by a magnetic compass and ***Distance*** from the speedometer drive of the vehicle's transmission, the **Odograph M-1** combines these two factors mechanically in its plotting unit to produce corresponding movements in a plotting pencil on a map table. Accuracy is up to one mile of error in 150 miles of travel.

Odograph M-1 ***Surveys*** need not run in a straight line, but follow easiest routes and bypass obstacles. Not only does the **Odograph's** automatic mapping pencil locate the position of the vehicle at any point, but **Co-ordinate Counter Dials** in the plotting unit record in miles and tenths of miles the grid co-ordinates of the vehicle with respect to the starting point.

ODOGRAPH M-1 instrument provides a fast, accurate method for:

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- ***SURVEYING*** or finding points whose relative position to given base is known.

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Low-level bucket action. You can roll the bucket back only a few inches off the ground—heaping bucket-loads even when the material is scattered only a few inches high. And you can carry the full load *low*—your driver can *see* where he's going, he doesn't have to travel *backwards*.

No clutch—faster cycles. There's no clutch pedal on a MICHIGAN. You can actually shift between Forward and Reverse *while moving:* simply push the hand-lever on the steering column—MICHIGAN'S power-shift transmission shifts instantly. Power-shifting saves time and energy every cycle. Your operators will say: "This sure beats riding a heavy-duty clutch all day!"

See it in action—on your own job. Write us and we'll arrange a demonstration. MICHIGANS are built to handle jobs too tough for other rubber-tired Tractor Shovels—*let us prove it*, without obligation. Write for details on the pay-as-you-go MICHIGAN Lease Plan—you can put these machines to work without laying out a penny of capital.

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